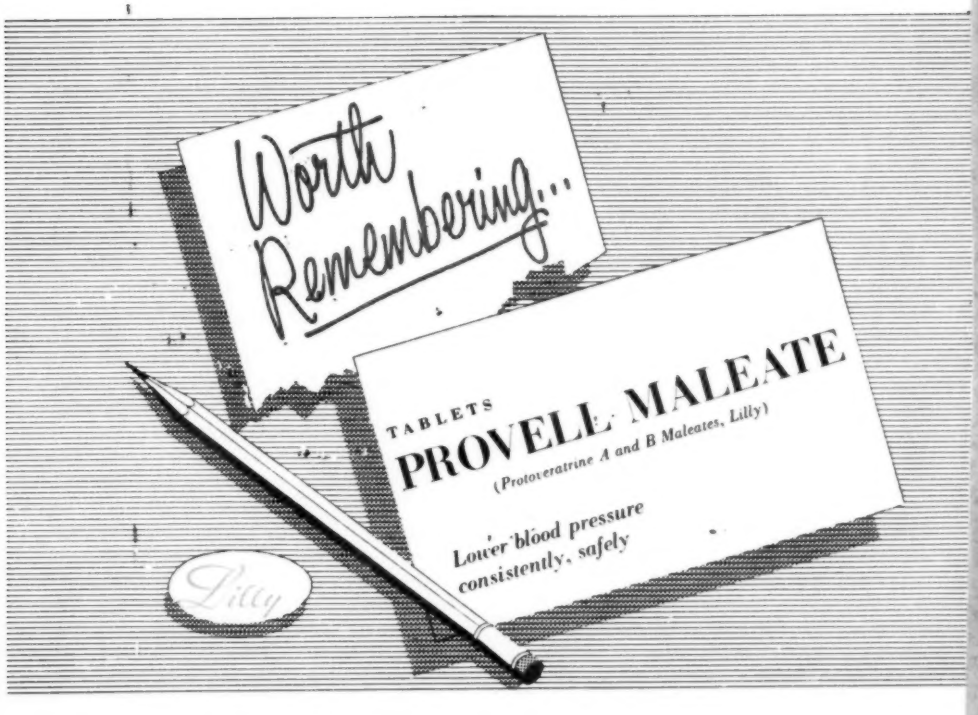
JAN 5 1954

MEDICAL LIBRARY
HISTORICAL BUILDING
DES MOINES, IOWA

Arizona Medicine

Journal of

ARIZONA MEDICAL ASSOCIATION



Vol. 10, No. 12 • DECEMBER, 1953 • TABLE OF CONTENTS — PAGE V

XUM

XUM

Breathing comfort as well as proper drainage and aeration of the sinuses during upper respiratory infections is assured by the swift and prolonged decongestive action of

NEO-SYNEPHRINE®

HYDROCHLORIDE

By shrinking the swollen mucosa, Neo-Synephrine permits drainage of purulent matter, restoring free breathing and relieving the headache caused by clogged passages.

RAPID AND PROLONGED ACTION Clearing of nasal obstruction follows within seconds after application of Neo-Synephrine and is unusually prolonged, so that comparatively few daily applications are necessary throughout the course of a cold.

WELL TOLERATED Neo-Synephrine is notable for its relative freedom from sting, virtual absence of compensatory congestion and also has been found relatively free from systemic side effects such as nervous excitation, cardiac reaction or insomnia even when tested on hypertensive, cardiac and hyperthyroid patients.[1]

NO APPRECIABLE INTERFERENCE WITH CILIARY ACTIVITY Neo-Synephrine not only restores nasal patency, but is compatible with ciliary action.

NO DROWSINESS Neo-Synephrine may be used by the ambulatory patient without danger of producing drowsiness or related sedative action. Applied topically, Neo-Synephrine confines its action to the upper respiratory passages.

SUPPLIED:

0.25% solution (plain), 1 oz., 4 oz. and 16 oz. bottles.

0.25% solution (aromatic), 1 oz. and 16 oz. bottles.

0.5% solution, 1 oz. bottles.

1% solution, 1 oz., 4 oz. and 16 oz. bottles.

0.5% water soluble jelly, ½ oz. tubes.

Neo-Synephrine, trademark reg. U.S. & Canada, brand of phenylephrine

1. Van Alyea, O. E., and Donnelly, Allen: Arch. Otolaryng., 49:234, Feb., 1949.

WINTHROP-STEARNS INC. • New York 18, N. Y. • Windsor, Ont.

ACCIDENT HOSPITAL SICKNESS

INSURANCE

For Physicians, Surgeons, Dentists Exclusively

$5,000 accidental death — Quarterly $8.00 **$25 weekly indemnity, accident and sickness**	**$15,000 accidental death — Quarterly $24.00** **$75 weekly indemnity, accident and sickness**
$10,000 accidental death — Quarterly $16.00 **$50 weekly indemnity, accident and sickness**	**$20,000 accidental death — Quarterly $32.00** **$100 weekly indemnity, accident and sickness**

COST HAS NEVER EXCEEDED AMOUNTS SHOWN
ALSO HOSPITAL INSURANCE

	Single	Double	Triple	Quadruple
60 days in Hospital	5.00 per day	10.00 per day	15.00 per day	20.00 per day
30 days of Nurse at Home	5.00 per day	10.00 per day	15.00 per day	20.00 per day
Laboratory Fees in Hospital	5.00	10.00	15.00	20.00
Operating Room in Hospital	10.00	20.00	30.00	40.00
Anesthetic in Hospital	10.00	20.00	30.00	40.00
X-Ray in Hospital	10.00	20.00	30.00	40.00
Medicines in Hospital	10.00	20.00	30.00	40.00
Ambulance to or from Hospital	10.00	20.00	30.00	40.00
	COSTS (Quarterly)			
Adult	2.50	5.00	7.50	10.00
Child to age 10	1.50	3.00	4.50	6.00
Child over age 19	2.50	5.00	7.50	10.00

$4,000,000.00 INVESTED ASSETS — **PHYSICIANS CASUALTY ASSOCIATION** **PHYSICIANS HEALTH ASSOCIATION** — **$19,500,000.00 PAID FOR CLAIMS**

51 years under the same management

400 First National Bank Building — Omaha 2, Nebraska

$200,000.00 deposited with State of Nebraska for protection of our members

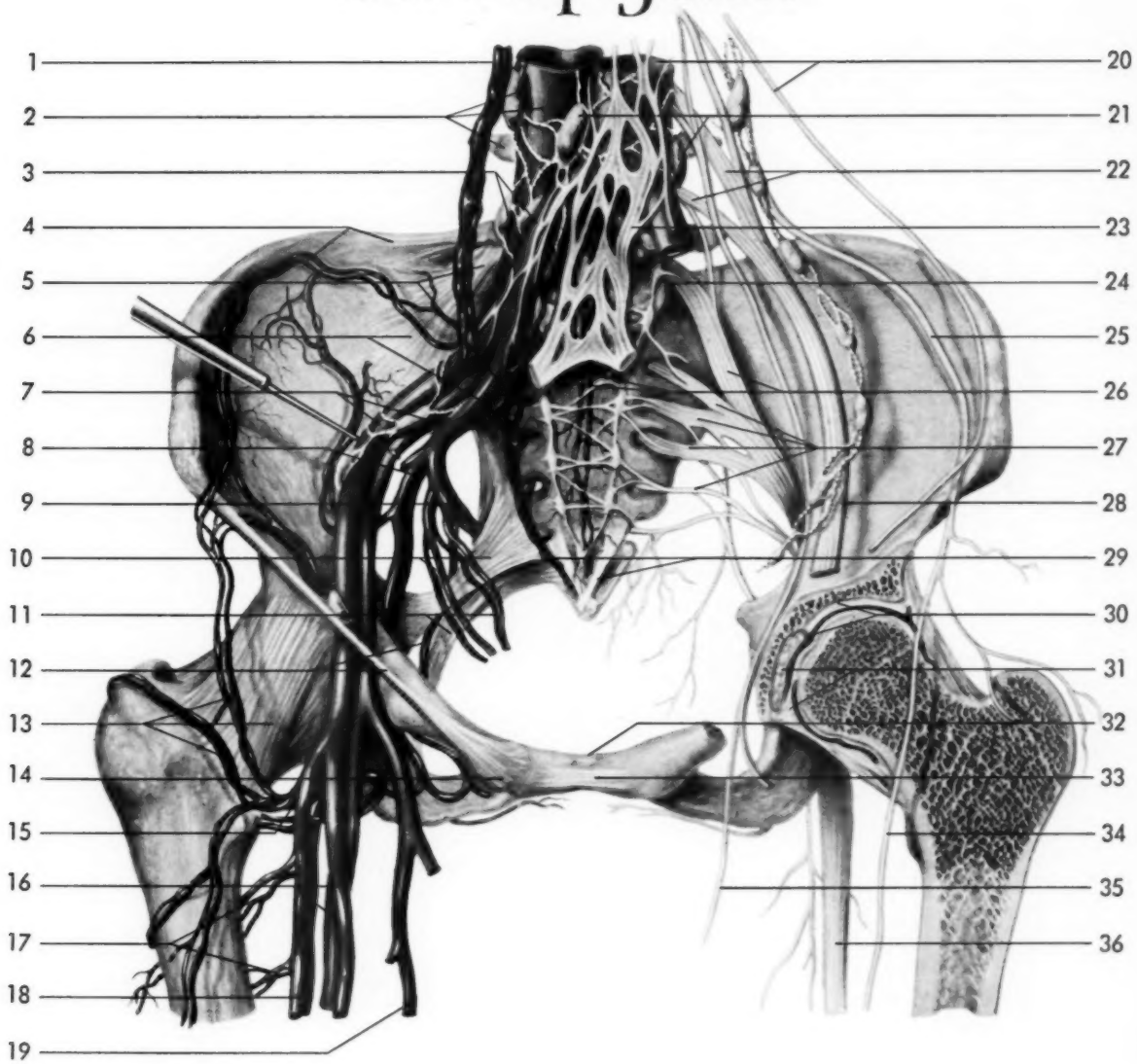
SOUTHWESTERN SURGICAL
SUPPLY CO.

YOUR COMPLETE SOURCE IN THE SOUTHWEST
FOR ALL ETHICAL MEDICAL EQUIPMENT AND
SUPPLIES.

●

PHOENIX TUCSON ALBUQUERQUE EL PASO

Anatomy *of the* Pelvis *and* Hip Joint



1 Ovarian artery and vein
2 Vena cava; lumbar lymph nodes
3 Right common iliac artery and vein
4 Iliolumbar ligament; branches of iliolumbar artery and vein
5 Lumbosacral ligament; superior gluteal artery and vein
6 Anterior sacroiliac ligament; internal iliac (hypogastric) artery
7 External iliac artery and vein
8 Obturator artery and vein
9 Inferior gluteal artery and vein
10 Sacrospinous ligament; uterine artery and vein
11 Sacrotuberous ligament; vaginal artery and vein
12 Inguinal ligament; internal pudendal artery
13 Iliofemoral ligament; branches of lateral femoral circumflex artery and vein
14 Lacunar ligament
15 Lateral femoral circumflex artery and vein
16 Femoral artery and vein
17 Perforating arteries and veins
18 Deep femoral artery and vein
19 Great saphenous vein
20 Aorta; ilioinguinal nerve
21 Lateral aortic lymph nodes
22 Lumbar nerves
23 Hypogastric sympathetic plexus
24 Sympathetic trunk
25 Lateral femoral cutaneous nerve
26 Middle sacral artery and vein; lumbosacral trunk
27 Sacral nerves
28 Femoral nerve
29 Lateral sacral artery and vein; anterior sacrococcygeal ligament
30 Lunate articular cartilage; joint cavity
31 Acetabular fat pad; ligamentum teres
32 Interpubic fibrocartilage
33 Superior pubic ligament
34 Anterior branch of lateral femoral cutaneous nerve
35 Obturator nerve
36 Great sciatic nerve

This is one of a series of paintings by Paul Peck, illustrating the anatomy of various organs and tissues of the body which are frequently attacked by infection, where aureomycin may prove useful.

Lederle

XUM

Many infections attack the pelvic organs,
as well as the surrounding bony structures.

Aureomycin*

CHLORTETRACYCLINE

promptly controls susceptible infections involving the bladder, the reproductive organs, the blood and lymph vessels, the pelvic peritoneum, the pelvic bones and the hip joints. The frozen pelvis and the pelvic cripple are becoming things of the past and Aureomycin has often proved life-saving.

* TRADE-MARK

LEDERLE LABORATORIES DIVISION

AMERICAN Cyanamid COMPANY

30 Rockefeller Plaza, New York 20, N. Y.

ARIZONA MEDICINE

Journal of ARIZONA MEDICAL ASSOCIATION

VOL. 10, NO. 12 DECEMBER, 1953

TABLE OF CONTENTS

OFFICERS

ARIZONA MEDICAL DIRECTORY VI
WOMAN'S AUXILIARY DIRECTORY VI

ORIGINAL ARTICLES

RESERPINE AND THE ALSEROXYLON ALKALOIDS OF RAUWOLFIA SERPENTINA IN HYPERTENSION 419
Travis Winsor, M.D., Los Angeles, California
PRESENT CONCEPTS REGARDING GOITER 425
Herbert H. Davis, M.D., Omaha, Nebraska
THE NEPHROTIC SYNDROME (PART II OF A THREE PART ARTICLE) 429
Derrill B. Manley, M.D., Phoenix, Arizona

MEDICAL PROBLEMS

PHOENIX CLINICAL CLUB 434
Drs. Leslie B. Smith and Frank J. Milloy, Phoenix, Arizona

PRESIDENT'S PAGE

A MERRY CHRISTMAS AND A HAPPY NEW YEAR 446
Edward Hayden, M.D., President, Arizona Medical Association, Inc.

EDITORIAL

HOW MUCH CAN ONE BELIEVE? 447

TOPICS OF CURRENT MEDICAL INTEREST

RX., DX., AND DRS. 449
Guillermo Osler, M.D.
WITH OUR BOARD OF PHARMACY INSPECTOR 448
Arizona Pharmaceutical Association
SECOND ANNUAL CANCER SEMINAR 452
IN MEMORIAL — MARSHALL E. BURGESS, M.D. 454
THE PROFESSIONAL BOARD "Arizona's Mental Health Program" 455
Ernest A. Born, M.D., Prescott, Arizona
NEWS ITEM 458
HILL BURTON HOSPITAL CONSTRUCTION IN ARIZONA 458
ALCOHOLIC ANONYMOUS "FIFTH ANNUAL INTERNATIONAL MEETING" 458

WOMAN'S AUXILIARY

CIVIL DEFENSE 456
Mrs. Frank A. Shallenberger, Tucson, Arizona
NEWS ITEM 456
Mrs. George Enfield, Phoenix, Arizona

DIRECTORY

LABORATORIES XXI
SANATORIUM DIRECTORY XXII
DRUGGISTS DIRECTORY XXV
PHYSICIANS DIRECTORY XXVII

Published monthly by the Arizona Medical Association. Business office at 424 Heard Building, Phoenix, Arizona. Subscription $3.00 a year, single copy 25c. Entered as second class matter March 1, 1921, at Postoffice at Phoenix, Arizona, Act of March 3, 1879.

XUM

Directory

THE ARIZONA MEDICAL ASSOCIATION, INC.
Organized 1892 401 SECURITY BUILDING
234 NORTH CENTRAL AVE., PHOENIX, ARIZONA

OFFICERS AND COUNCIL

Edward M. Hayden, M.D. ..... President
1603 N. Tucson Boulevard, Tucson, Arizona
Oscar W. Thoeny, M.D. ..... President-Elect
1313 N. 2nd Street, Phoenix, Arizona
Harry E. Thompson, M.D. ..... Vice-President
433 N. Tucson, Boulevard, Tucson, Arizona
Dermont W. Melick, M.D. ..... Secretary
15 East Monroe, Phoenix, Arizona
Clarence E. Yount, Jr., M.D. ..... Treasurer
P. O. Box 1626, Prescott, Arizona
Lindsay E. Beaton, M.D. ..... Speaker of House
1650 N. Campbell Ave., Tucson, Arizona
Jesse D. Hamer, M.D. ..... Delegate to AMA
15 East Monroe, Phoenix, Arizona
Robert E. Hastings, M.D. ..... Alternate-Delegate to AMA
1014 N. Country Club Road, Tucson, Arizona
R. Lee Foster, M.D. ..... Editor-In-Chief
15 East Monroe, Phoenix, Arizona

DISTRICT COUNCILORS

David C. James, M.D. ..... Central District
926 E. McDowell Rd., Phoenix, Arizona
Kent H. Thayer, M.D. ..... Central District
1313 N. 2nd Street, Phoenix, Arizona
Leslie B. Smith, M.D. ..... Central District
926 East McDowell Road, Phoenix, Arizona
Herbert B. Potthoff, M.D. ..... Northeastern District
P. O. Box 128, Holbrook, Arizona
Ernest A. Born, M.D. ..... Northwestern District
107 North Cortez, Prescott, Arizona
Guy B. Atonna, M.D. ..... Southeastern District
447 10th Street, Douglas, Arizona
Wilkins R. Manning, M.D. ..... Southern District
620 N. Country Club Road, Tucson, Arizona
Royal W. Rudolph, M.D. ..... Southern District
1627 N. Tucson, Boulevard, Tucson, Arizona
Abe I. Podolsky, M.D. ..... Southwestern District
1601 5th Avenue, Yuma, Arizona

COUNCILOR AT LARGE

Thomas H. Bate, M.D. ..... Past President
15 East Monroe, Phoenix, Arizona

BOARDS

PROFESSIONAL: Hugh C. Thompson, M. D., Tucson (Chairman); Ernest A. Born, M. D., Prescott; Edward H. Bregman, M. D., Phoenix; Orin J. Farness, M. D., Tucson; Lewis H. Howard, M. D., Tucson; Elvie B. Jolley, M. D., Bisbee; Joseph M. Kinkade, M. D., Tucson; Milton C. F. Semoff, M. D., Tucson; George A. Williamson, M. D., Phoenix.

PUBLIC RELATIONS: Leo J. Kent, M. D., Tucson (Chairman); Howard C. Lawrence, M. D., Phoenix (Vice Chairman); Lindsay E. Beaton. M. D., Tucson; Carlos C. Craig, M. D., Phoenix; Donald F. DeMarse, M. D., Holbrook; Wilkins R. Manning, M. D., Tucson; Robert M. Matts, M. D., Yuma; Zenas B. Noon M. D., Nogales.

STANDING COMMITTEES

GRIEVANCE: Thomas H. Bate, M. D., Phoenix (Chairman); Lindsay E. Beaton, M. D., Tucson; Preston T. Brown, M. D., Phoenix; Arthur C. Carlson, M. D., Phoenix; Robert E. Hastings M. D., Tucson; Hilary D. Ketcherside, M. D., Phoenix; Harry T. Southworth, M. D., Prescott.

HISTORY & OBITUARIES: W. Warner Watkins, M. D., Phoenix (Historian); R. Lee Foster, M. D., Phoenix; Dermont W. Melick, M. D., Phoenix; Hal W. Rice, M. D., Tucson.

INDUSTRIAL RELATIONS: William B. McGrath, M. D., Phoenix, (Chairman); Carl H. Gans, M. D., Morenci; Ronald S. Haines, M. D., Phoenix; Zenas B. Noon, M. D., Nogales; John R. Schwartzmann, M. D., Tucson.

LEGISLATION: Reed D. Shupe, M. D., Phoenix (Chairman); Jesse D. Hamer, M. D., Phoenix (Vice Chairman); Carl W. Ahl, M. D., Douglas; William H. Bates, M. D., Cottonwood; Walter Brazie, M. D., Kingman; Ellis V. Browning, M. D., Springerville; Max Costin, M. D., Tucson; Donald F. Hill, M. D., Tucson; Bert E. Lambrecht, M. D., Miami; Stanton C. Lovre, M. D., Clifton; Wilkins R. Manning, M. D., Tucson; Robert M. Matts, M. D., Yuma; Zenas B. Noon, M. D., Nogales; Donald A. Polson, M. D., Phoenix; Wallace A. Reed, M. D., Phoenix; Leo Schnur, M. D., Grand Canyon; Leslie B. Smith, M. D., Phoenix; Noel G. Smith, M. D., Safford; Guss B. Steward, M. D., Coolidge; Kent H. Thayer, M. D., Phoenix; Harry E. Thompson, M. D., Tucson; Myron G. Wright, M. D., Winslow.

MEDICAL DEFENSE: Preston T. Brown, M. D., Phoenix (Chairman); Ernest A. Born, M. D., Prescott; Harold W. Kohl, M. D., Tucson.

MEDICAL ECONOMICS: Hilary D. Ketcherside, M. D., Phoenix (Chairman); Royal W. Rudolph, M. D., Tucson; Hugh C. Thompson, M. D., Tucson.

PUBLISHING: R. Lee Foster, M. D., Phoenix (Chairman); Carroll C. Creighton, M. D., Flagstaff; Donald E. Nelson, M. D., Safford; Darwin W. Neubauer, M. D., Tucson.

SCIENTIFIC ASSEMBLY: Oscar W. Thoeny, M. D., Phoenix (Chairman); Joseph Bank, M.D., Phoenix; David Engle, M.D., Tucson; Francis M. Findlay, M. D., Kingman; David C. James, M. D., Phoenix; Wilkins R. Manning, M. D., Tucson; Donald E. Nelson, M. D., Safford; William A. Phillips, M. D., Yuma; Herbert B. Potthoff, M. D., Holbrook.

Woman's Auxiliary

OFFICERS OF THE AUXILIARY TO THE ARIZONA MEDICAL ASSOCIATION — 1953 - 1954

President ..... Mrs. George S. Enfield
335 W. Cambridge Ave., Phoenix
President-Elect ..... Mrs. Brick P. Storts
3228 E. 5th Street, Tucson
1st Vice President (Organization) ..... Mrs. Roy Hewitt
130 Camino Miramonte, Tucson
2nd Vice President (Program) ..... Mrs. Charles S. Powell
698 Ninth Ave., Yuma
Treasurer ..... Mrs. R. Lee Foster
2215 N. 11th Ave., Phoenix
Recording Secretary ..... Mrs. Louis Hirsch
Rt. 6, Box 710, Tucson
Corresponding Secretary ..... Mrs. William F. Schoffman
36 N. Country Club Dr., Phoenix
Director (1 year) ..... Mrs. T. C. Harper
175 S. Third Street, Globe
Director (1 year) ..... Mrs. William F. Schoffman
36 N. Country Club Dr., Phoenix
Director (2 year) ..... Mrs. Frederick W. Knight
Safford

STATE COMMITTEE CHAIRMEN 1953-1954

Bulletin ..... Mrs. Hiram Cochran
2716 E. 4th Street, Tucson
Chaplin ..... Mrs. James R. Moore
305 W. Granada, Phoenix
Civil Defense ..... Mrs. Frank A. Shallenberger
345 S. Eastbourne Dr., Tucson
Convention ..... Mrs. A. E. Cruthirds
60 E. Country Club Drive, Phoenix
Finance ..... Mrs. Paul S. Causey
38 W. Camelback Road, Phoenix
Historian ..... Mrs. Benjamin Herzberg
125 W. Rose Lane, Phoenix
Legislation ..... Mrs. C. L. Von Pohle
274 N. Arizona Ave., Chandler
Medical Education Fd. ..... Mrs. J. B. Tucker
Box 1042, Casa Grande
Nurse Recruitment ..... Mrs. Max Costin
2648 E. 4th Street, Tucson
Parliamentarian ..... Mrs. Royal W. Rudolph
3935 Miner, Tucson
Publicity ..... Mrs. Ashton B. Taylor
46 E. Marlette Dr., Phoenix
Public Relations ..... Mrs. John K. Bennett
2325 E. Waverly St., Tucson
Revisions ..... Mrs. Jesse D. Hamer
1819 N. 11th Ave., Phoenix
Student Nurse Loan Fund ..... Mrs. Donald A. Polson
2163 W. Earll Dr., Phoenix
Todays Health ..... Mrs. James C. Soderstrom
Box 82, Whipple
Nominating Com. Chairman ..... Mrs. Royal W. Rudolph
3935 Miner, Tucson
Mental Health ..... Mrs. Delbert Secrist
35 Calle Clara Vista, Tucson

COUNTY PRESIDENTS AND OFFICERS 1953-1954

GILA COUNTY

President ..... Mrs. Ira E. Harris
Box 1296, Miami
Vice President ..... Mrs. Charles T. Collopy
Box 623, Miami
Secretary-Treasurer ..... Mrs. William E. Bishop
605 S. 3rd St., Globe

MARICOPA COUNTY

President ..... Mrs. Paul B. Jarrett
501 E. Pasadena, Phoenix
President-Elect ..... Mrs. Robert H. Cummings
5830 Arcadia Lane, Phoenix
1st Vice President ..... Mrs. C. Selby Mills
5821 N. 11th, Phoenix
2nd Vice President ..... Mrs. George A. Williamson
537 W. Rose Lane, Phoenix
Rec. Secretary ..... Mrs. Robert A. Price
335 W. Windsor Ave., Phoenix
Cor. Secretary ..... Mrs. Samuel H. Hale
Rt. 1, Box 382, Scottsdale
Treasurer ..... Mrs. Dwight H. Porter
5650 N. 12th, Phoenix

PIMA COUNTY

President ..... Mrs. Hugh C. Thompson
135 Palomar Dr., Tucson
President-Elect ..... Mrs. Joseph M. Kinkade
335 S. Country Club Rd., Tucson
1st Vice President ..... Mrs. Seymour I. Shapiro
2410 E. Elm St., Tucson
2nd Vice President ..... Mrs. George A. Shetter
2733 E. Mable St., Tucson
Rec. Secretary ..... Mrs. John K. Bennett
2325 E. Waverly St., Tucson
Cor. Secretary ..... Mrs. D. E. Engle
4012 E. Cooper, Tucson
Treasurer ..... Mrs. Richard K. Hausmann
2639 E. 8th St., Tucson

PINAL COUNTY

President ..... Mrs. Howard Holmes
Eloy
Vice President ..... Mrs. James T. O'Neil
Casa Grande
Sec-Treasurer ..... Mrs. Robert Z. Collings
Box 475, Casa Grande

YAVAPAI COUNTY

President ..... Mrs. Melvin W. Phillips
829 Flora Ave., Prescott
Vice President ..... Mrs. Earnest Geever
Whipple
Sec-Treasurer ..... Mrs. William A. Marlowe
Whipple

YUMA COUNTY

President ..... Mrs. Phillip G. Corliss
Somerton, Box 68
Vice President ..... Mrs. John J. Kloby
Ave. C, Yuma
Sec-Treasurer ..... Mrs. Robert M. Matts
Yuma

XUM

Taste Toppers . . . for all ages

that's what physicians and patients alike call these two favorite dosage forms of Terramycin because of their unsurpassed good taste. They're nonalcoholic — a treat for patients of all ages, with their pleasant raspberry taste. And they're often the dosage forms of first choice for infants, children and adults of all ages.

Terramycin®

BRAND OF OXYTETRACYCLINE

Pediatric Drops

Each cc. contains 100 mg. of pure crystalline Terramycin. Supplied in 10 cc. bottles with special dropper calibrated at 25 mg. and 50 mg. May be administered directly or mixed with nonacidulated foods and liquids. Economical 1.0 gram size often provides the *total dose* required for treatment of infections of average severity in infants.

Supplied: Bottles of 1.0 Gm.

Oral Suspension *(Flavored)*

Each 5 cc. teaspoonful contains 250 mg. of pure crystalline Terramycin. Effective against gram-positive and gram-negative bacteria, including the important coli-aerogenes group, rickettsiae, certain large viruses and protozoa.

Supplied: Bottles of 1.5 Gm.

Pfizer **PFIZER LABORATORIES,** *Brooklyn 6, N. Y., Division, Chas. Pfizer & Co., Inc.*

TO:

THE MEDICAL PROFESSION

OF ARIZONA

A VERY MERRY CHRISTMAS

AND A HAPPY NEW YEAR

ARE THE BEST WISHES

OF THE

FRASER MEDICAL SUPPLY CO.

2207 E. Indian School Rd.

AM 5-0421 • Phoenix, Arizona

We offer the benefit of our years of
experience in
real estate transactions

CLEVENGER REALTY

Jack Clevenger, Realtor

W. Thomas at Central Avenue

Phone AM 6-2494

Phoenix Arizona

"Stands Ready To Serve"

We Solicit Your Business

We base this solicitation on our long years of experience in handling the investment accounts of several thousand men and women in Phoenix and the State of Arizona.

Our personnel is well qualified to render you intelligent service.

Our facilities are complete and enable us to offer you excellent service in all departments of investing – government and tax free municipal bonds; corporation stocks and bonds; local securities; listed or "over-the-counter" issues; new underwritings; investment trusts.

You will also find our ground floor location in the heart of Phoenix a great convenience with free parking at Phoenix Title & Trust parking lot, Second Avenue at Monroe.

We believe you will like doing business with us.

Phone AL 8-6646

REFSNES, ELY, BECK & CO.

Members New York Stock Exchange
112 West Adams Street – Phoenix, Arizona

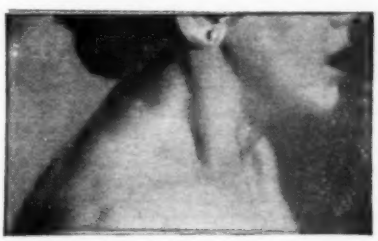
...“truly extraordinary” results in intractable bronchial asthma

Cortone®

ACETATE
(CORTISONE ACETATE, MERCK)

In a review article on hormonal therapy,[1] complete relief of symptoms was reported in 62 per cent of 116 asthma patients. Another 24 per cent were made “quite comfortable.” Duration of relief varied widely, with remissions occasionally lasting as long as several months. The author calls these results “truly extraordinary.”

[1]Evans, R. R., and Rackemann, F. M.: *A.M.A. Arch. Int. Med.* 90:96–127, July 1952.



Before treatment. Observe typical facies and tense sternocleidomastoid.

After therapy with CORTONE. Note relaxation of accessory muscles of respiration.

All CORTONE *Tablets carry this trade-mark:* 4

CORTONE *is the registered trade-mark of Merck & Co., Inc. for its brand of cortisone.*

MERCK & CO., INC.
Manufacturing Chemists
RAHWAY, NEW JERSEY

© Merck & Co., Inc.

A Family SAVINGS Institution

Mother, Dad, Sister and Brother . . . all invited to open and add regularly to an INSURED First Federal Savings account.

Everyone in the family will enjoy the cheerful service, 3% earnings and INSURED safety.

First Federal Savings by Lou Ann

ACCOUNTS INSURED

Earnings 3% per annum

PHOENIX: 30 West Adams Street
2933 N. Central • 4201 S. Central
YUMA: Orange at Fourth Avenue

MR
MEDICAL RENTS

• HOSPITAL BEDS
FRACTURE BEDS

• WHEEL CHAIRS
HOSPITAL & PORTABLE

• INVALID WALKERS
ADULT & CHILD SIZE

OXYGEN THERAPY SERVICE
Phone ALpine 4-9227
Phoenix, Arizona

Rainbow Water

☆

A constantly reliable bottled water . . .
Pure . . . Fresh . . . Naturally Soft
Untreated . . . Sterilized Equipment
Delivered. Also Distilled Water.

☆

PHONE 2-4645

☆

RAINBOW WATER CO.

332 East Seventh Tucson

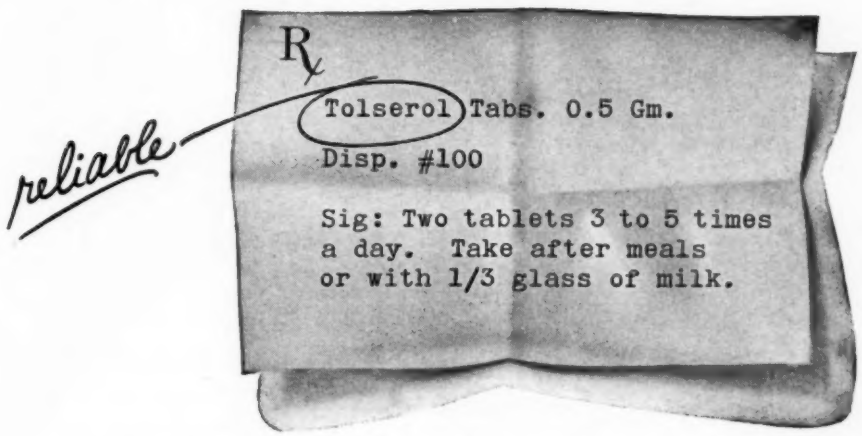
WHEN AN ORTHOPEDIC MATTRESS IS INDICATED

Restful, healthful body adjustment is supplied by the Spring Air Back Supporter Mattress, with its high density construction of lightly compressed coils of extra large diameter. Made of conventional, time-proven materials, to a new design which provides positive back support without interfering with circulation. See it at your favorite furniture store . . . recommend it with confidence.

Spring Air MATTRESSES BOX SPRINGS

Manufactured in Phoenix by
SOUTHWEST MATTRESS CO.
1710 EAST WASHINGTON ST.
PHOENIX, ARIZONA

RAPID ABSORPTION—*MAXIMUM THERAPEUTIC EFFECT*



The clinical effectiveness of different brands of mephenesin tablets depends on their rate of absorption. A mephenesin tablet that disintegrates slowly is absorbed slowly. The resulting low blood levels may never produce a maximum therapeutic effect. Results with such a tablet are usually poor.

Tolserol Tablets are a result of extensive study and are formulated to disintegrate rapidly for fast absorption, thus maintaining optimum blood levels.

Tolserol

(*Squibb Mephenesin*)

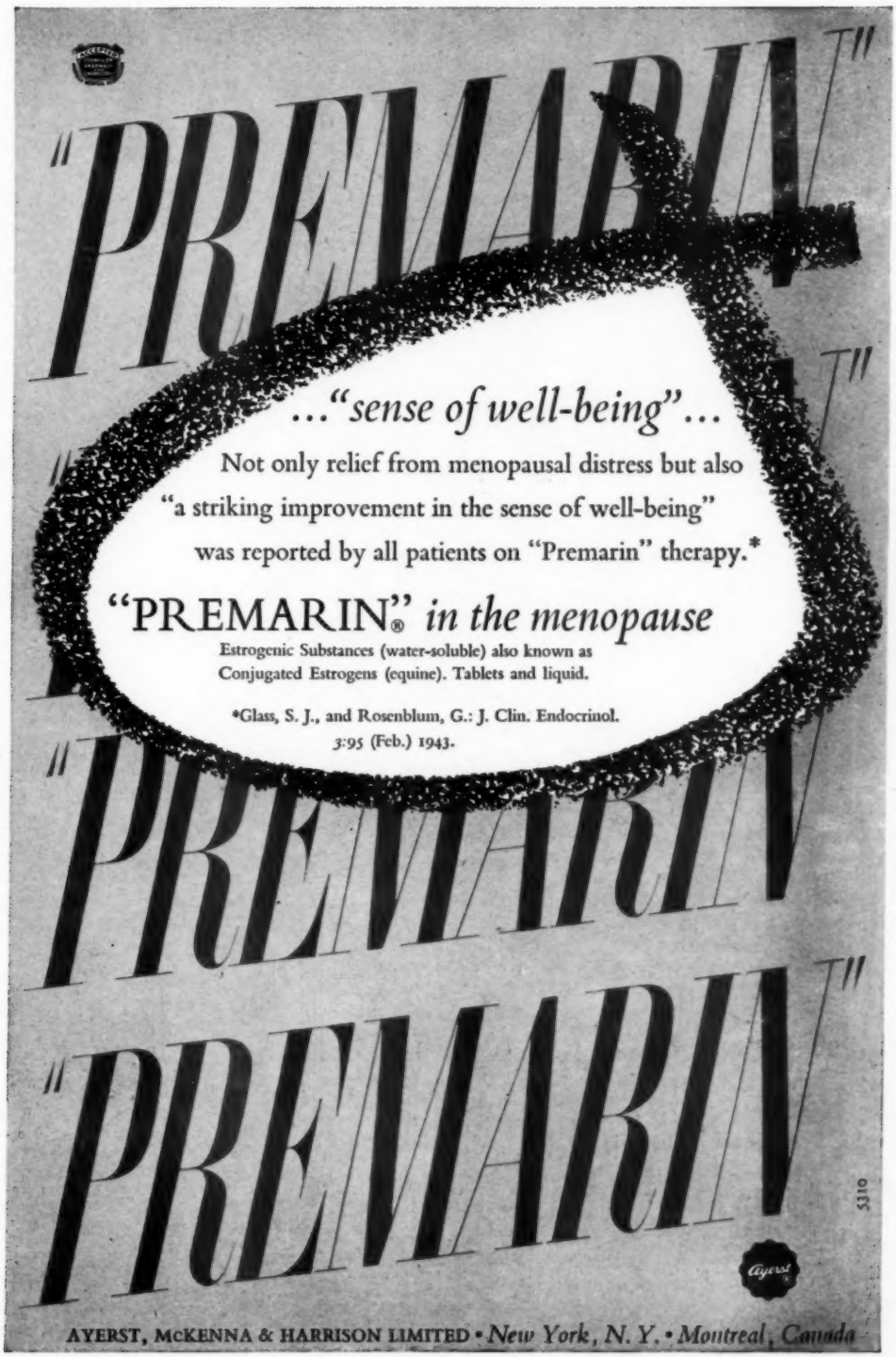
Complete information on the use of Tolserol in muscle spasm of rheumatic disorders, in neurologic disorders and in acute alcoholism is available from the Professional Service Department, Squibb, 745 Fifth Avenue, New York 22, N. Y.

SQUIBB

RAYTHEON
Microtherm
wherever diathermy is indicated
RAYTHEON Radar Microtherm offers you the modern microwave method of precision heat application.
MICROTHERM operates at 2450 megacycles, as contrasted with the highest television range of 920 megacycles, hence TV interference is avoided.
MICROTHERM provides penetrating energy for deep heating — dosage may be accurately timed.
MICROTHERM is safe as well as quick, easy to apply as well as clinically efficient.
Ask for a demonstration or let us mail you the latest clinical reports on Radar Microwave Diathermy.
APPROVED BY THE F. C. C.
CERTIFICATE NO. D-477
UNDERWRITERS LABORATORY
TAKE THE TIME to investigate the diathermy equipment used in leading clinics, hospitals and doctors' offices — over fifteen thousand Microtherms now in use.
RAYTHEON
Excellence in Electronics
RAYTHEON MANUFACTURING COMPANY
Power Tube Division • Waltham 54, Mass.

STANDARD SURGICAL SUPPLY
710 NORTH FIRST STREET PHOENIX • ARIZONA

BRANCH: 1706 E. SPEEDWAY – TUCSON, ARIZONA


"PREMARIN"
...“sense of well-being”...
Not only relief from menopausal distress but also
“a striking improvement in the sense of well-being”
was reported by all patients on “Premarin” therapy.*
“PREMARIN”® in the menopause
Estrogenic Substances (water-soluble) also known as
Conjugated Estrogens (equine). Tablets and liquid.
*Glass, S. J., and Rosenblum, G.: J. Clin. Endocrinol.
3:95 (Feb.) 1943.
5310
Ayerst
AYERST, McKENNA & HARRISON LIMITED • New York, N. Y. • Montreal, Canada

They all like

pediatric

ERYTHROCIN

TRADE MARK

STEARATE

(Erythromycin Stearate, Abbott)

oral suspension

. . . the cocci-killing antibiotic for children of all ages. Tasty, stable, ready for instant use. *No mixing required*—drug retains potency for at least 18 months.

Winter infections—otitis media, bronchitis, sinusitis, pharyngitis and pneumonia—are especially sensitive to *Pediatric* ERYTHROCIN. Also, pyoderma, erysipelas, certain cases of osteomyelitis, and other infectious conditions.

Many physicians make it a practice to always prescribe *Pediatric* ERYTHROCIN when the organism is staphylococcus, because of the high incidence of staphylococcic resistance to many other antibiotics. And when the organism is resistant or when the patient is sensitive to penicillin and other antibiotics.

Pediatric ERYTHROCIN is specific in action—*less likely to alter normal intestinal flora than most other antibiotics.* Gastrointestinal disturbances are rare. No serious side effects reported.

Pediatric ERYTHROCIN can be administered before, after or with meals. Available in 2-fluidounce, pour-lip bottles.
Your little patients will like *Pediatric* ERYTHROCIN. Abbott

1-251

DOSAGE

One 5-cc. teaspoonful
represents
100 mg. of ERYTHROCIN
25-lb. child • ½ teaspoonful
50-lb. child • 1 teaspoonful
100-lb. child • 2 teaspoonfuls
Every 4 to 6 hours

You, too, have a place
IN
THE WORLD MEDICAL ASSOCIATION

as a member of the medical profession anywhere in the world civilian...in the armed forces...retired

you will benefit from...

1. **Joining 700,000 doctors from 43 nations** in a worldwide movement to help you attain the highest possible level of medical practice and scientific advance.
2. **Reports obtainable only in the World Medical Association Bulletin** which is issued to you quarterly and contains facts on scientific, economic and social trends affecting the practice of medicine.
3. **Letters of introduction to foreign medical associations,** facilitating your professional contacts and exchange of ideas while traveling abroad.
4. **Representation before the World Health Organization,** UNESCO, the International Labor Organization, and other important bodies in order to maintain the honor and defend the international interests of your profession when these organizations discuss measures concerning medical practice.
5. **The satisfaction of sharing the progress of American medicine** with other lands and thus repaying them for the inspiration we have received from them.

what affects world medicine—affects you

this is your only voice in world medicine

W.M.A. Is Approved by the American Medical Association. **JOIN NOW!**

Dr. Louis H. Bauer, Secretary-Treasurer
U. S. Committee, Inc., World Medical Association
2 East 103rd Street, New York 29, New York

I desire to become an individual member of the World Medical Association, United States Committee, Inc., and enclose a check for $_____, my subscription as a:

_____ Member —$ 10.00 a year
_____ Life Member —$500.00 (No further assessments)
_____ Sponsoring Member—$100.00 or more per year

SIGNATURE _____

ADDRESS _____

_____

(Contributions are deductible for income tax purposes)

Upjohn

less-antigenic penicillin:

Cer-O-Cillin

Trademark Reg. U. S. Pat. Off. POTASSIUM

Available as:

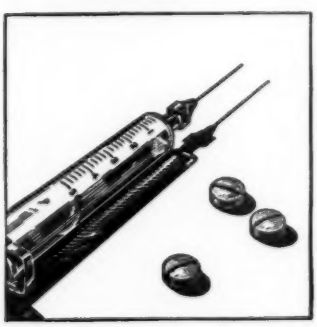
Sterile vials containing 200,000 and 500,000 units Crystalline Penicillin O Potassium.

Bottles of 12 buffered tablets, each containing 100,000 units Crystalline Penicillin O Potassium.

Depo*-Cer-O-Cillin Chloroprocaine for Aqueous Injection in vials containing 1,500,000 units Crystalline Chloroprocaine Penicillin O.

*TRADEMARK, REG. U. S. PAT. OFF.

The Upjohn Company, Kalamazoo, Michigan



Conclusive evidence

of the effectiveness and low toxicity

of Furadantin

in treating bacterial urinary tract infections

is provided in its recent

acceptance by the Council

FURADANTIN®

brand of nitrofurantoin

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

The N.N.R. monograph on Furadantin states:

EATON LABORATORIES Inc.
NORWICH, NEW YORK

"**Nitrofurantoin.—Furadantin (Eaton).—**

Actions and Uses.—Nitrofurantoin, a nitrofuran derivative, exhibits a wide spectrum of antibacterial activity against both gram-positive and gram-negative micro-organisms. It is bacteriostatic and may be bactericidal to the majority of strains of Escherichia coli, Micrococcus (Staphylococcus) pyogenes albus and aureus, Streptococcus pyogenes, Aerobacter aerogenes, and Paracolobactrum species. The drug is less effective against Proteus vulgaris, Pseudomonas aeruginosa, Alcaligenes faecalis, and Corynebacterium species; many strains of these organisms may be resistant to it. However, bacterial resistance to other anti-infective agents is not usually accompanied by increase in resistance of the organisms to nitrofurantoin. The drug does not inhibit fungi or viruses.

Nitrofurantoin is useful by oral administration for the treatment of bacterial infections of the urinary tract and is indicated in pyelonephritis, pyelitis, and cystitis caused by bacteria sensitive to the drug. It is not intended to replace surgery when mechanical obstruction or stasis is present. Following oral administration, approximately 40% is excreted unchanged in the urine. The remainder is apparently catabolized by various body tissues into inactive, brownish compounds that may tint the urine. Only negligible amounts of the drug are recovered from the feces. Urinary excretion is sufficiently rapid to require administration of the drug at four to six hour intervals to maintain antibacterial concentration. The low oral dosage necessary to maintain an effective urinary concentration is not associated with detectable blood levels. The high solubility of nitrofurantoin, even in acid urine, and the low dosage required diminish the likelihood of crystalluria.

Nitrofurantoin has a low toxicity. With oral administration it occasionally produces nausea and emesis; however, these reactions may be obviated by slight reduction in dosage. An occasional case of sensitization has been noted, consisting of a diffuse erythematous maculopapular eruption of the skin. This has been readily controlled by discontinuing administration of the drug. Animal studies, using large doses administered over a prolonged period, have revealed a decrease in the maturation of spermatozoa, but this effect is reversible following discontinuance of the drug. Until more is known concerning its long-term effects, blood cell studies should be made during therapy. Frequent or prolonged treatment is not advised until the drug has received more widespread study. It is otherwise contraindicated in the presence of anuria, oliguria, or severe renal damage.

Dosage.—Nitrofurantoin is administered orally in an average total daily dosage of 5 to 8 mg. per kilogram (2.2 to 3.6 mg. per pound) of body weight. One-fourth of this amount is administered four times daily—with each meal and with food at bedtime to prevent or minimize nausea. For refractory infections such as Proteus and Pseudomonas species, total daily dosage may be increased to a maximum of 10 mg. per kilogram (4.5 mg. per pound) of body weight. If nausea is severe, the dosage may be reduced. Medication should be continued for at least three days after sterility of the urine is achieved."

XUM

'Carbo-Resin' Therapy Simplifies Control of Edema

- Permits more liberal salt intake, enhances palatability of diet
- Safely removes sodium from intestinal tract and prevents its reabsorption
- Decreases the frequency of need for mercurial diuretics by potentiating their effectiveness
- May be lifesaving therapy for patients who have developed a resistance to mercury
- Useful in congestive heart failure, cirrhosis of the liver, edema of pregnancy, hypertension, or whenever salt restriction is advisable

Eli Lilly and Company
Indianapolis 6, Indiana, U. S. A.

Suspended in orange juice

Baked into brownies or cookies

Blended into gelatin dessert

Lilly

Variety is the key to palatable 'Carbo-Resin' therapy.

'Carbo-Resin,' Unflavored, may be incorporated into cookies, fruit juices, and desserts. Printed recipes for your patients are available from the Lilly representative or direct from Indianapolis. A book containing low-sodium diets is also available for distribution to patients.

CAUTION: 'Carbo-Resin' is supplied in two forms—flavored and unflavored. Only 'Carbo-Resin,' Unflavored, is suitable for incorporation into recipes.

POWDER

'Carbo-Resin'

(CARBACRYLAMINE RESINS, LILLY)

MEDICAL LIBRARY
HISTORICAL BUILDING
DES MOINES, IOWA

ARIZONA MEDICINE
Journal of Arizona Medical Association

VOL. 10, NO. 12 DECEMBER, 1953

Original ARTICLES

RESERPINE AND THE ALSEROXYLON ALKALOIDS OF RAUWOLFIA SERPENTINA IN HYPERTENSION*

Travis Winsor, M.D.
Los Angeles, California

The purpose of the present report is to describe the use of two new hypotensive agents, reserpine** and the alseroxylon alkaloids of Rauwolfia serpentina***, for the medical management of essential hypertension and to discuss briefly some of the mechanisms which may be responsible for the elevation of blood pressure in this disease. A discussion of the possible mechanisms in the pathogenesis of hypertension is given to emphasize that essential hypertension is a syndrome in which many different factors play important parts and that, because of this, no single therapeutic agent known today is universally effective as a hypotensive agent. The drugs to be described, however, are effective in a sufficient number of patients with essential hypertension to make them valuable additions to the physician's armamentarium of hypotensive agents.

The etiology of essential hypertension in most patients is unknown, however, an increase in arteriolar tone is common to most. Arteriolar tone is controlled normally by humoral and neurogenic factors (Fig. 1), the former primarily from the kidney, adrenal, pituitary gland and liver, the latter from the central and sympathetic nervous systems. Ferris(1) has shown that it is possible to differentiate the humoral from the neurogenic type by means of the blood pressure response to tetra-ethyl-ammonium chloride, a ganglionic blocking agent.

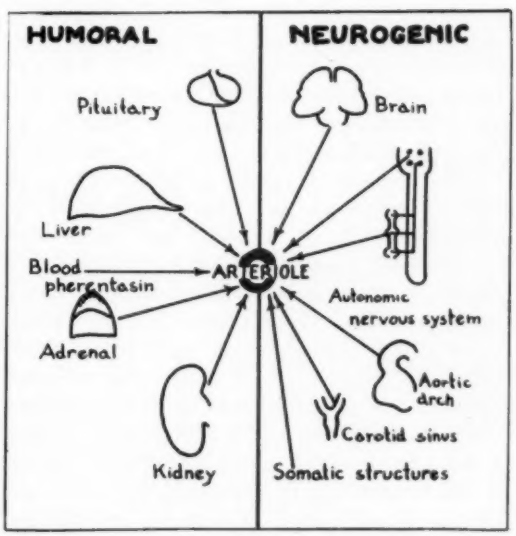


Fig. 1—Humoral and neurogenic factors controlling vasomotor tone.

Humoral factors controlling blood pressure: *Renal* control of arteriolar tone was described originally by Goldblatt(2) who demonstrated that renal ischemia resulted in increased systemic blood pressure (Fig. 2). It was shown later that renal ischemia liberated an enzyme, renin, which activated the alpha-globulin from the liver, hypertensinogen, to form angiotonin (also called hypertensin). Angiotonin raises blood pressure by acting directly on the arterioles in the presence of an intact adrenal gland(3). Another renal mechanism responsible for an elevated pressure is described by Shorr(4), who demonstrated two humoral fac-

*Presented in part at the Arizona State Medical Association Meeting, Tucson, April, 1953. These studies were aided in part by a grant from the Los Angeles Heart Association. Gratitude is expressed to Mrs. Angeline Smith for her technical assistance in these studies.
**Serpasil, Ciba
***Rauwiloid, Riker

XUM

tors which regulate capillary tone (Fig 3). These are a pressor substance, V.E.M. (vaso-excitor material) formed in the kidney and a depressor substance, V.D.M. (vaso-depressor material) formed chiefly in the liver but also in the spleen and skeletal muscles. V.D.M. is an iron-containing protein molecule called "ferritin". Under normal circumstances, V.E.M., and V.D.M. exist in dynamic equilibrium thereby regulating capillary tone. Although the liver forms V.D.M., it also is the source of its inactivation. Thus an increased capillary tone may result from increased V.E.M. formation, decreased V.D.M. formation, or an increased rate of V.D.M. inactivation. Certain derangements in the circulation, especially hypoxia, upset the normal equilibrium and result in alteration of blood pressure. *Adreno* cortical hypersecretion may be responsible for hypertension as it has been shown that excessive secretion of steroid hormones by the zona glomerulosa causes salt and water retention and nephrosclerosis(5). Nephrosclerosis in turn produces decreased pulsations of renal arteries and renal ischemia which leads to hypertension (Fig. 4). Page(3) has shown that the Goldblatt renal mechanism producing hypertension occurs only in the presence of intact adrenal glands. He suggests that angiotonin favors sodium loss and that sodium loss stimulates the adrenal cortex to produce sodium retention and nephrosclerosis. Thus a vicious circle is established. The liver plays a part in the regulation of arteriolar tone as shown by the studies of Davis and Tanturi(6) who lowered blood pressure by producing hypoxia of the liver. They have postulated that the hypotension resulted from either failure of the *liver* to inactivate V.D.M. or failure to produce hypertensinogen. *Pherentesin,* a long-acting non-protein pressor amine described by Olsen and Schroeder(7) and found in the arterial blood of patients with hypertension may be important in the etiology of essential hypertension (Fig. 1) by increasing arteriolar tone.

Neurogenic types of hypertension which involve the nervous system and not the endocrine organs are usually transient in nature and therefore often are not immediate medical problems. Pure neurogenic hypertension occurs probably as a transient pressor reaction following transient stimulation of nerves. If the stimulus is sufficiently strong or prolonged, a mixed neurohumoral type of hypertension may

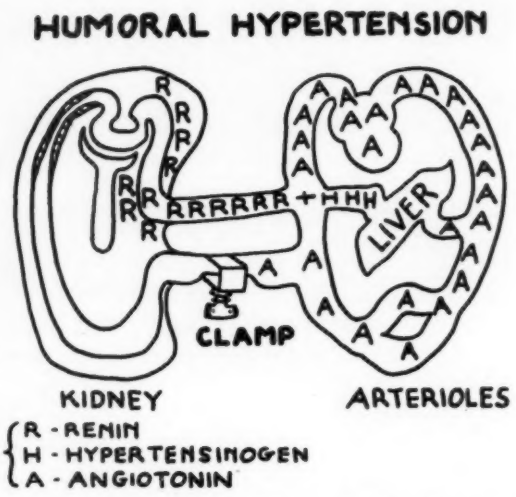


Fig. 2—Humoral type of hypertension results when renal ischemia occurs. Renin activates hypertensinogen to form angiotonin which results in hypertension in the presence of normal adrenal activity.

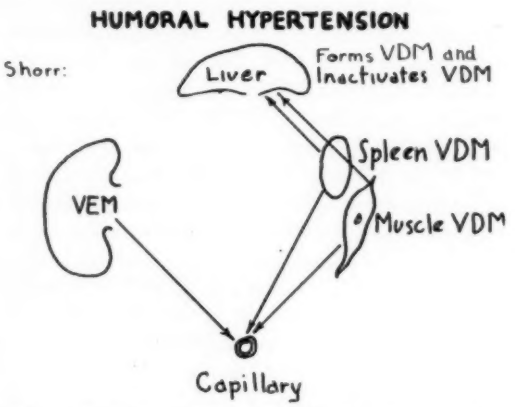


Fig. 3—V. E. M. and V. D. M. control capillary tone and regulate blood pressure.

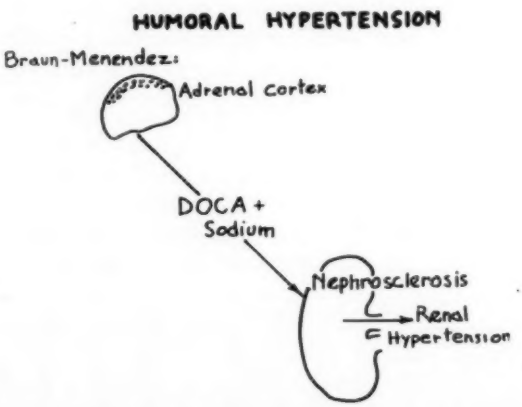


Fig. 4—Adrenal cortical hyperfunction especially in the presence of excess sodium results in nephrosclerosis and hypertension.

result (Fig 5). Nickerson(8) has stated that neurogenic transient hypertension often precedes fixed hypertension. This is borne out by the finding of Hines(9) who has shown a higher incidence of fixed hypertension among hyperreactors to the cold pressor test than in a control group of normal reactors.

Neurohumoral hypertension has been produced by Taylor, Page and Corcoran(10) by means of cross-circulation experiments in dogs. They have shown that upon stimulating the afferent fibers of the vagus and sciatic nerves a *cerebral vasopressor substance* is liberated which is distinct from epinephrine, nor-epinephrine, renin, pitressin, and angiotonin (Fig. 5) and is inhibited by hydrazinophthalazine. Selye (11) has described another neurohumoral mechanism in which *stress* stimulates the pituitary to form ACTH (Fig. 6). This stimulates the adrenal cortex to produce corticosteroids which, in the presence of sodium and protein produce nephrosclerosis and hypertension. Still another neurohumoral mechanism regulating blood pressure is reflex in nature originating in the *carotid sinus, and aortic arch* and other receptor organs (Fig. 7)(12). This reflex acts as follows: The vasomotor center in the floor of the fourth ventricle produces constant pressor stimulation of the sympathetic nervous system resulting in increased arteriolar tone and an elevated blood pressure which distends the aorta, carotid sinus and other receptors. Distension of these structures stimulates afferent nerves which serve as check valves by inhibiting the vasomotor center and the pressure is lowered. Arteriosclerosis involving these receptor organs decreases their distensibility thereby producing less central inhibition and less effective lowering of pressure.

From a consideration of these and other mechanisms, it becomes evident that in many cases the elevation of pressure present in hypertension is due to multiple factors and the results of therapy in these cases, at least, will be better when more than one therapeutic agent is employed.

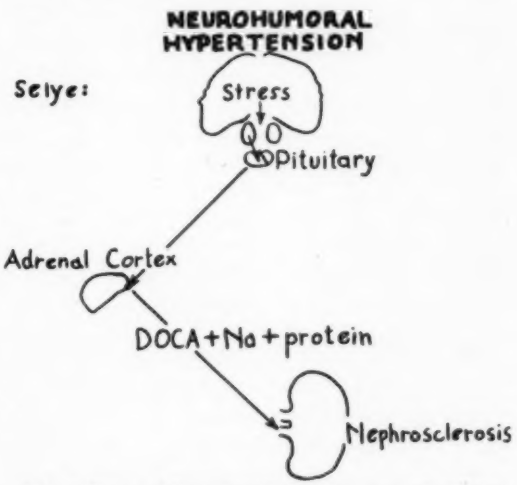


Fig. 6—Stress produces hypertension by way of pituitary, adrenal and renal pathways.

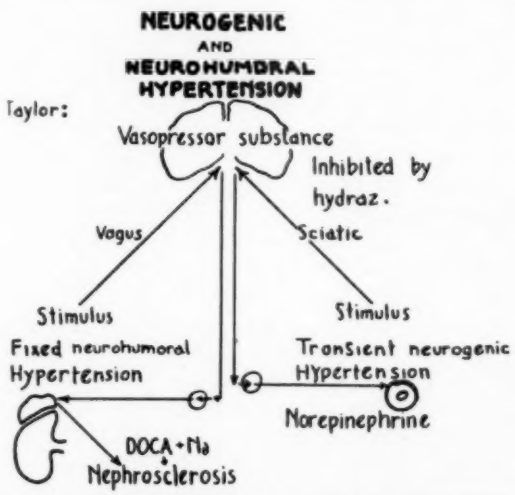


Fig. 5—On the right: Neurogenic transient hypertension occurs as a result of stimulating the afferent fibers of the vagus or sciatic nerves.. Nor-epinephrine is released which increases arteriolar tone. On the left: Neurohumoral fixed hypertension mediated through the adrenal gland and kidney causes permanent hypertension.

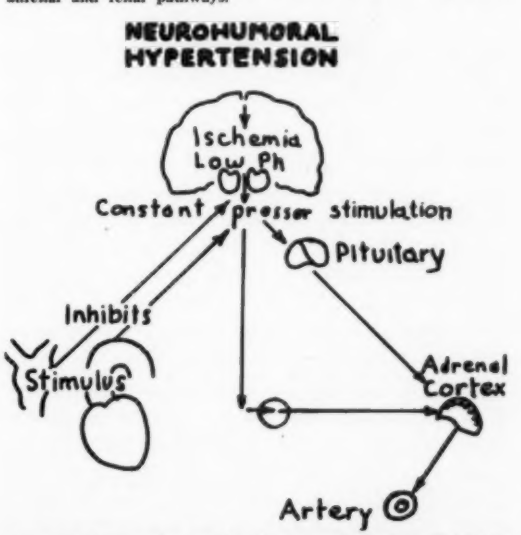


Fig. 7—Hypertension results if the aorta and carotid sinus cannot distend. This may occur with arteriosclerosis of these structures. In this case inhibition of the vasomotor center fails to occur and blood pressure increases.

XUM

METHODS AND MATERIALS

Fifty-six patients with essential hypertension were studied. Their ages ranged from 24 to 70 years. All were ambulatory out-patients who had been examined periodically for 2 to 4 years. All patients received either the single alkaloid reserpine or the alseroxlyon alkaloidal fraction of R. Serpentina. Sixteen were studied on reserpine and 40 on the alseroxylon fraction. Reserpine is a single alkaloid of known composition containing carbon, hydrogen, oxygen and nitrogen(13). The alseroxylon fraction is a mixture of at least nine alkaloids which is biologically standardized for its hypotensive, bradycardic and sedative effects and is chemically standardized by optical rotation, and melting, and freezing point determinations(14). A double-blind technique was employed in which neither the doctor nor the patient knew the agent which was administered. Special care was taken in recording blood pressures. The lowest of three readings was recorded and usually more than one examiner checked the readings. All pressures were taken with the patient in the sitting position after 20 minutes rest unless stated otherwise. The values shown in the accompanying charts represent the blood pressures after a minimum of 8 weeks on each drug.

RESULTS

The effects of reserpine on the blood pressure and pulse rate of 16 patients is shown in Table I. The patients ranged in age from 24 to 68 years. Sixty-nine per cent were males. The Keith-Wagener classification ranged from I to III. The dose employed was from 0.1 to 1.0 mg. with an average of 0.54 mg. given usually in a single dose before bed. Before therapy, the average blood pressure was 181.6/111.6 mm. Hg. and the average pulse rate 76.2 beats per minute. After eight weeks of continuous medication, the average fall in systolic pressure was 24 mm. (13.2%) and the diastolic pressure 18.1 mm. (16.2%) with an average fall in pulse rate of eight beats (10.5%). Side-effects occurred in certain patients receiving 0.5 mg. daily or more. The most common side-effect was lethargy which occurred usually in the morning and was improved with additional coffee or dextroamphetamine in small doses. Aching in the arms or legs, nasal obstruction with or without rhinorrhea, diarrhea, dizziness, dreams and dyspnea at rest occurred with the larger doses but were not encountered when therapeutic doses were administered. Five of these patients were given the drug continually for three months and in no instance did resistance to the drug develop. The time to reach the lowest blood pressure after initiating therapy was studied in 10 patients who received from 0.25 to 0.5 mg. daily. Fifty percent of the patients showed the greatest fall of pressure after two weeks, 30% in three weeks and 20% in a longer period of time. The length of time for the blood pressure to return to control levels after stopping the drug was studied in 10 patients. Fifty per cent of the patients showed a return to control levels in 2.5 weeks, 30% in 3.5 weeks and 20% returned in a longer period of time. The effect of the standing position on the blood pressure and pulse rate was studied in five patients receiving from 0.25 to 0.5 mg. daily for two months. The blood pressure and pulse rate were recorded in the supine and standing positions and the per cent change recorded. Before the drug the average systolic pressure fell 14.0% and after the drug it fell 14.1%. Before the drug the average fall in diastolic pressure was 2.8% with 2.0% after medication. Before the drug the pulse rate increased 7.3% but after 2.6% Thus it is evident that reserpine in the doses employed did not produce postural hypotension, however the postural increase in pulse rate seen before the drug was inhibited.

TABLE I

				Control			Reserpine		Differences	
Pt. #	Age	Sex	Keith Wagener	Blood Pressure	Pulse Rate	Dose mg. /24 hr	Blood Pressure	Pulse Rate	Blood Pressure S / D	Pulse Rate
39	58	M	III	182/100	82	0.10	158/90	60	-24 / -10	-22
19	36	M	II	160/110	75	0.10	132/100	68	-28 / -10	-7
1	28	M	II	150/110	100	0.25	138/102	100	-12 / -8	0
25	65	F	II	184/130	64	0.25	180/100	68	-4 / -10	/4
69	60	F	II	210/110	84	0.50	150/80	84	-60 / -30	0
33	47	M	II	152/90	88	0.50	138/80	78	-14 / -10	-10
50	67	F	II	170/90	75	0.50	150/80	84	-20 / -10	/9
7	54	F	II	184/120	84	0.50	142/92	60	-42 / -28	-24
5	64	M	II	218/136	84	0.50	200/110	60	-18 / -26	-24
16	68	M	II	164/112	72	0.50	130/90	54	-34 / -32	-18
10	57	F	I	192/126	62	0.50	170/104	86	-22 / -22	/4
16	42	M	I	190/120	80	0.50	165/90	68	-25 / -30	-12
51	24	M	II	174/100	68	1.00	138/80	86	-36 / -20	-2
3	60	M	II	195/102	54	1.00	180/100	53	-15 / -2	-2
4	60	M	III	200/130	64	1.00	200/110	60	0 / -20	-4
61	52	M	II	180/120	84	1.00	150/98	64	-30 / -22	-20
Mean	52.7			181.6/111.6	76.2	0.54	157.5/96.	68.2	-24 / -18.	-8
Min.	24			150/90	54	0.10	130/80	52	0 / -2	0
Max.	68			218/136	100	1.00	200/110	100	-60 / -32	-24
Percent decrease from mean blood pressure and pulse rate									-13.2	-16.2 10.5

S - Systolic
D - Diastolic

Table I—Reserpine produced a significant fall in blood pressure and pulse rate with the doses employd.

The effect of the alseroxylon fraction on blood pressure and pulse rate of 40 patients was studied (Table II). The ages ranged from 24 to 70 and 53% were males. The Keith-Wagener classifications was from I to IV. The dose of the drug varied from 2.0 to 8.0 mg. in 24

TABLE II

Pt. #	Age	Sex	Keith Wagener	Control		Alseroxylon Alkaloids		Differences		
				Blood Pressure	Pulse Rate	Dose mg./24 hr.	Blood Pressure	Pulse Rate	Blood Pressure S	Blood Pressure D	Pulse Rate
22	65	F	III	250/108	88	2.0	180/100	80	-70	-8	-8
26	63	M	II	190/110	72	2.0	160/110	68	-30	0	-4
31	42	M	I	140/110	98	2.0	134/90	72	-6	-20	-23
33	47	M	II	170/100	78	2.0	142/92	80	-28	-8	∫2
40	50	M	II	220/130	100	2.0	220/130	70	0	-10	-30
9	59	M	II	180/120	80	2.0	172/112	72	-8	-8	-8
18	55	M	II	158/100	90	4.0	140/110	58	∫5	∫10	-2
8	48	F	II	205/130	60	4.0	162/110	52	-43	-20	-8
10	57	F	I	192/126	62	4.0	160/102	60	-32	-24	-2
14	60	F	II	240/140	86	4.0	160/100	70	-80	-40	-16
15	53	M	III	180/120	60	4.0	150/110	53	-30	-10	∫3
16	43	M	I	210/105	100	4.0	190/120	80	-20	∫15	-20
17	63	F	II	160/98	72	4.0	138/80	64	-22	-18	-8
1	30	M	II	150/100	100	4.0	120/90	82	-30	-10	-18
19	36	M	II	170/110	80	4.0	130/100	72	-40	-10	-8
23	40	F	II	200/108	92	4.0	150/90	88	-50	-18	-4
27	58	M	II	160/90	72	4.0	140/90	68	-20	0	-4
28	24	M	I	145/98	84	4.0	142/90	80	-3	-8	-4
30	70	F	III	300/120	88	4.0	176/84	54	-24	-36	-24
32	60	F	III	216/112	100	4.0	170/100	76	-46	-12	-24
35	57	F	II	210/130	78	4.0	150/100	72	-60	-30	-6
37	56	M	II	220/120	75	4.0	210/105	68	-10	-15	-7
41	58	M	II	192/120	86	4.0	190/110	70	-2	-10	-16
42	50	F	II	192/120	76	4.0	136/82	82	-56	-32	-24
25	60	F	II	248/136	80	4.0	176/100	68	-72	-36	-12
45	40	F	I	160/100	90	4.0	138/88	78	-22	-12	-12
2	38	F	II	160/120	90	4.0	190/110	84	-18	-10	-6
3	64	M	II	190/100	54	4.0	190/100	50	0	0	-4
11	53	F	II	220/90	80	4.0	200/100	62	-20	∫10	-18
47	65	M	II	208/110	70	4.0	150/90	68	-58	-20	-2
12	55	F	II	248/150	74	8.0	240/140	68	-8	-10	-6
13	60	F	II	184/106	96	8.0	193/119	68	∫11	∫4	-28
21	26	F	IV	270/190	100	8.0	150/105	80	-40	-85	-20
29	47	M	II	230/112	90	8.0	140/100	64	-70	-12	-26
38	47	M	III	220/130	68	8.0	190/140	60	-30	∫10	-8
39	58	M	III	190/110	80	8.0	180/90	64	-10	-20	-16
7	54	F	II	184/120	94	8.0	170/90	64	-14	-30	-30
36	42	F	III	250/160	120	8.0	230/140	96	-20	-20	-6
4	63	M	III	230/129	74	8.0	190/100	60	-40	-29	-14
6	57	M	III	180/120	64	8.0	184/130	60	∫4	∫10	-4
Mean	53.3			197.9/117.5	81.6	6.7	167.8/103.2	70.2	-27.6	-14.1	-11.3
Min.	24			140/90	54	2	120/80	50	0	0	2
Max.	70			270/190	100	8	240/140	96	-80	-85	-30
Percent decrease from mean blood pressure and pulse rate									-13.9	-12.0	-13.8

P - Pulse
S - Systolic
D - Diastolic

Table II—The alseroxylon alkaloids produced a significant fall in blood pressure and pulse rate with the doses employed.

hours with an average of 4.7. The average duration of medication was two months. The average control blood pressure was 197.9/117.5 mm. Hg. and the pulse rate 81.6 beats per minute. The average fall in systolic pressure after medication was 27.6 mm. (13.9%) and the diastolic fall 14.1 mm. ((12.0%). The average decrease in pulse rate was 11.3 beats per minute (13.8%). Side effects were few but increased when more than 4 mg. was taken each 24 hours. Lethargy, nasal obstruction, diarrhea, aching arms and legs, dyspnoea at rest and dreams occurred with the larger doses in the order named.

A comparison of the hypotensive effects of reserpine and the alseroxylon fraction in the same individual was made in eight patients who tolerated both drugs well (Table III). The patients had been maintained on each of these agents until the lowest blood pressure had been reached. The average dose of reserpine was 0.49 mg. in 24 hours and of alseroxylon was 4.5 mg. in 24 hours. All patients tolerated both agents with no significant side-effects. Reserpine produced average decreases of systolic pressure, diastolic pressure and pulse rate of 12.6%, 13.7% and 4.6% respectively. The alseroxylon fraction produced an average fall of systolic pressure, diastolic pressure, and pulse

TABLE III

Pt. #	Control		Reserpine			Differences			Alseroxylon Alkaloids			Differences		
	Blood Pressure	Pulse Rate	Dose mg./24 hr.	Blood Pressure	Pulse Rate	Blood Pressure S	Blood Pressure D	Pulse Rate	Dose mg./24 hr.	Blood Pressure	Pulse Rate	Blood Pressure S	Blood Pressure D	Pulse Rate
39	182/100	62	0.10	158/90	60	-24	-10	-12	4	150/80	70	-32	-20	-12
50	170/90	75	0.50	130/80	64	-40	-10	∫0	2	134/90	75	-36	0	0
49	210/110	84	0.50	150/80	84	-60	-30	0	4	142/88	76	-68	-22	-8
1	190/110	100	0.25	158/102	100	-32	-8	0	3	134/80	92	-56	-30	-8
16	190/120	80	0.50	165/90	68	-25	-30	-12	4	158/100	80	-32	-20	0
19	160/110	75	0.10	132/100	68	-28	-10	-7	6	128/80	68	-32	-30	-7
6	200/130	64	1.00	200/110	60	0	-20	-4	8	150/130	56	-50	0	-8
3	190/102	84	1.00	180/100	82	-10	-2	-2	8	180/100	80	-10	-2	-4
Mean	192.1/109.4	76.1	0.49	158.1/94.0	72.0	-23.0	-13.0	-5.5	4.5	155.9/96.9	76.5	-35.0	-12.4	-5.9
Min.	150/90	54	0.10	132/80	52	0	-2	0	2	128/80	56	-5	0	0
Max.	210/130	100	1.00	200/110	100	-60	-30	-12	8	190/130	92	-68	-32	-12
Percent below control						-12.6	-13.7	-6.0				-24.0	-11.2	-7.2

P - Pulse
S - Systolic
D - Diastolic

Table III—The magnitude of the reduction of blood pressure with reserpine and the alseroxylon alkaloids was similar with the doses employed.

TABLE IV

Pt. #	Age	Sex	Control		Hexamethonium		Differences		Alseroxylon Alkaloids		Differences	
			Blood Pressure	Pulse Rate	Dose mg./24hr	Blood Pressure	Pulse Rate	Blood Pressure S	Blood Pressure D	Pulse Rate	Dose mg./24hr	Blood Pressure	Pulse Rate	Blood Pressure S	Blood Pressure D	Pulse Rate
17	68	F	170/90	72	750	360/80	71	-10	-10	-1	2.0	140/70	65	-30	-20	-7
15	53	M	180/120	60	750	280/130	76	-20	∫10	∫16	4.0	120/90	62	-60	-30	∫2
11	53	F	220/100	80	750	220/90	90	0	-10	∫10	4.0	200/100	62	-20	0	-18
5	48	F	205/130	56	1250	155/120	76	-50	-10	∫18	4.0	142/110	52	-63	-20	-8
4	61	M	230/130	72	750	200/80	72	-30	-50	0		195/95	65	-35	-35	-4
1	30	M	150/100	100	1000	130/102	105	-20	∫2	∫5	4.0	130/92	85	-20	-8	-15
19	36	M	170/110	80	1250	150/100	80	-20	-10	0	4.0	130/100	70	-40	-10	-10
22	65	F	250/100	88	1000	240/110	90	-10	∫2	∫2	2.0	180/100	80	-70	-8	-8
39	58	M	190/110	80	750	170/100	84	-20	-10	∫4	8.0	180/90	64	-10	-20	-16
6	58	M	192/120	86	1000	200/120	86	∫8	0	∫2	4.0	190/110	70	-2	-10	-16
Mean	53.0		195.7/109.8	77.8	1025	182.5/103.2	83.6	-17.2	-6.6	∫5.8	3.6	162.7/104.1	67.6	-24	-15.6	-10
Min.	30		150/90	60	750	130/80	71	0	0	0	2	120/70	52	-2	0	∫2
Max.	68		250/130	100	1500	240/130	105	-50	-50	∫18	8	200/110	85	-70	-30	-18
Percent deviation from control								-8.7	-6.1	∫7.4				-12.3	-13.7	-12.8

P - Pulse
S - Systolic
D - Diastolic

Table IV—The alseroxylon alkaloids produced a greater reduction in blood pressure than did hexamethonium in the doses employed.

rate of 14.5%, 11.2% and 7.7% respectively. Thus reserpine and the alseroxylon alkaloids decreased blood pressures approximately equal amounts. The pulse rate was somewhat lower with the latter.

A comparison of the hypotensive effects of hexamethonium* with the alseroxylon fraction was made in 10 patients (Table VI). The ages were from 30 to 68 years; 60% were males. The control blood pressure and pulse rate averaged 195.7/109.8 mm. Hg. and 77.8 beats per minute respectively. The average dose of hexamethonium was 1025 mg./24 hours and the average dose of alseroxylon was 3.6 mg./24 hours. Each agent was given for not less than two months. In those instances in which resistance to hexamethonium developed, the lowest pressure reach was entered on the table. The average fall of systolic and diastolic blood pressure after hexamethonium was 17.2 mm. (8.7%) and 6.6 mm. (6.1%) respectively while the average rise in pulse rate was 5.8 beats per minute (7.4%). These values may be compared with those obtained with the alserroxylon alkaloids in which the systolic and diastolic fall in pressure averaged 24.0 mm. Hg. (12.3%) and 15.1 mm. (13.7%) respectively and the average fall in pulse rate of 10 0 beats per minute (12.8%). Thus in the dosages em-

*Esomide—Ciba

ployed a greater hypotensive effect was obtained with the alseroxylon fraction than with hexamethonium. It is to be noted that relatively small, well-tolerated, doses of hexamethonium were employed.

The comparative hypotensive effects of hydrazinophthalazine* and the alseroxylon fraction were studied in eight patients whose ages ranged from 36 to 65 years (Table V). Sixty-two per cent were males. The average dose of hydrazinophthalazine was 109.3 mg. in 24 hours. When resistance developed to the drug, the lowest pressure reached with this agent was recorded. The average dose of alseroxylon was 4.0 mg. in 24 hours.

The average blood pressure and pulse rate before hydrazinophthalazine was 206.8/116.0 mm. Hg. with a pulse rate of 77.8 beats per minute. The average decrease in systolic and diastolic pressures after treatment were 23.7 mm. Hg. (11.4%) and 9.7 mm. Hg. (8.4%) respectively with an average increase in pulse rate of 5.1 beats per minute (6.5%). These values may be compared with those obtained with alseroxylon in which the average fall in pressure was 31.6 mm. Hg. (15.3%) and 14.1 mm. Hg. (12.1%), with an average fall in pulse rate of 11.8 beats per minute (15.2%). Thus the alseroxylon fraction proved to be more hypotensive in the doses employed than hydrazinophthalazine. It should be noted that relatively small, well-tolerated doses of hydrazinophthalazine were employed.

DISCUSSION

The results indicate that the single alkaloid, reserpine (0.1 to 1.0 mg. in 24 hours) and the alseroxylon alkaloids (2.0 to 8.0 mg. in 24 hours) produced satisfactory reductions in systolic and diastolic blood pressures of equal magnitude. The bradycardic effect was somewhat less with reserpine in all studies. This was a slight but consistent finding. The most satisfactory hypotensive results were obtained in young individuals who had tachycardia and labile blood pressures, whose pulse pressures were not persistently wide and whose blood pressure elevations were not of many years' duration. Satisfactory reductions in blood pressure and pulse rate were seen, however, in patients in whom these criteria were not met. The alseroxylon alkaloids were found to be more hypotensive than either hydrazinophthalazine or hexamethonium in the doses employed. The studies made it apparent, however, that large increases in the doses of the alseroxylon fraction beyond the therapeutic level did not produce a progressively greater fall in blood pressure as occurred usually with hexamethonium and hydrazinophthalazine. The dose of reserpine was more critical becase of the increased potency of the drug. The general plan of therapy was to produce maximum hypotensive effects with either reserpine or alseroxylon and then add hydrazinophthalazine, hexamethonium or both in order to produce maximum lowering of pressure. Wilkins(15) has shown a potentiating action between R. Serpentina and hydrazinophthalazine and other agents. The tolerated dose of reserpine in most patients was from 0.1 to 0.5 mg. daily and of alseroxylon from 2 to 6 mg. daily.

TABLE V

			Control		Hydrazinophthalazine*		Differences			Alseroxylon Alkaloids			Differences		
Pt. #	Age	Sex	Blood Pressure	Pulse Rate	Dose mg/24hr	Blood Pressure	Pulse Rate	Blood Pressure S	Blood Pressure D	Pulse Rate	Dose mg/24hr	Blood Pressure	Pulse Rate	Blood Pressure S	Blood Pressure D	Pulse Rate
15	53	M	180/120	60	75	190/130	75	↑10	↑10	↑15	4.0	120/90	62	-60	-30	↓2
11	53	F	220/100	90	75	200/90	84	-20	-10	↓6	4.0	200/100	62	-20	0	-18
8	48	F	205/130	60	200	160/100	72	-45	-22	↓12	4.0	162/110	52	-43	-20	-8
19	36	M	170/110	90	100	160/112	78	-10	↑2	-2	6.0	130/100	70	-40	-10	-10
22	65	F	230/100	89	50	210/90	89	-60	-10	0	2.0	180/100	80	-70	-8	-8
37	58	M	220/120	75	150	190/110	80	-30	-10	↓5	6.0	210/105	68	-10	-15	-7
39	59	M	190/110	80	100	155/90	85	-35	-20	↓5	8.0	180/90	64	-10	-20	-16
40	56	M	220/130	100	75	200/120	100	-20	-10	0	2.0	220/120	70	0	-10	-30
Mean	52.6		206.8/116.0	77.8	109.3	183.1/106.2	83	-23.7	-9.7	↑5.1	4.0	175.2/101.8	66	-31.1	-14.1	-11.8
Min	36		170/100	60	50	155/90	72	↓10	↓10	↓2	2.0	120/90	52	0	0	↓2
Max	65		230/130	100	200	200/130	100	-60	-22	↓15	8.0	220/120	80	-70	-30	-30
Percent Deviation from control								↓11.4	↓8.4	↑6.5				↓15.3	↓12.1	↓15.2

S - Systolic
D - Diastolic

* Hydrazinophthalazine, Apresoline, Ciba

Table V—The alseroxylon alkaloids produced a greater reduction in blood pressure than did hydrazinophthalazine in the doses employed.

The mode of action of R. Serpentina is known in part. Reserpine and the alseroxylon alkaloids both act centrally, and thus would be effective in neurogenic hypertension (Fig. 1). Certain manifestations of a central action are observed in man and animals(14). A sedative effect is common and, in the rabbit, there is central disturbance of the body temperature regulating mechanism with large doses of the drug(13). It is not known at this time if R. Serpentina inhibits the cerebral vasopressor substance of Taylor, Page and Corcoran (Fig. 5) or if its action is on central synaptic junctions or elsewhere in the brain. These alkaloids from R. Serpentina suppress hypertension produced by electrical stimulation of the afferent vagus, afferent sciatic nerve (Fig. 5) and that resulting from lowering of pressure in the carotid sinus (Fig. 7).(13, 14). These agents do not have a direct vasodilating effect on peripheral arteries such as occurs with benzyl-imidazoline*(13), do not inhibit or re-

*Apresdine—Ciba

*Priscoline—Ciba

move the hypertensive effects of epinephrine or norepinephrine such as occurs with methylimidazoline*(13, 14), do not block autonomic ganglia as does hexamethonium(13, 14), do not stimulate the parasympathetic nervous system to produce vasodilatation as with acetylbetamethyl choline(13) and do not stimulate the cartoid sinus and other peripheral receptor organs, such as occurs with protoveratrine(16, 17, 18,) to inhibit the vasomotor center. Thus the action of R. Serpentina, in certain respects resembles the action of hydrazinophthalazine (10), and the hydrogenated alkaloids of ergot (19). From the theoretical point of view, it would seem that R. Serpentina would be effective in neurogenic and neurohumoral types of hypertension but not in the pure humoral type of cases. Better results can be expected from a combination of reserpine or alseroxylon with other agents, such as hydrazinophthalazine(15), acting at least in part through humoral mechanisms, than from the alkaloids alone.

SUMMARY

Reserpine, an alkaloid of R. Serpentina, and the alseroxylon alkaloidal fraction of R. Serpentina are effective hypotensive agents for the treatment of neurogenic and neurohumoral hypertension. They may be used alone or in combination with certain other known hypotensive agents.

*Regitine—Ciba

REFERENCES

1. Ferris, E. B., Reiser, M. F., Stead, W. W. and Brust, A. A., Jr.: Clinical and Physiological Observations of Interrelated Mechanisms in Arterial Hypertension Tr. A. Am. Phys. 61:97, 1948.
2. Goldblatt, H.: The Renal Origin of Hypertension (Monograph in American Lectures in Pathology) Springfield, Ill. C. C. Thomas, 1949.
3. Page, I. H. and Lewis, L. A.: Arterial Pressure and Serum Protein Patterns in Adrenalectomized Hypertensive and Adrenalectomized Normotensive Dogs. Am. J. Physiol. 164:61, January, 1951.
4. Shorr, E., Zweifach, B. W. and Furchgott, R. F., Baez, S.: Hepatorenal Factors in Experimental Hyptertension. Trans. of First Conference on Factors Regulating Blood Pressure. Josiah Macy, Jr. Foundation. New York, 1937.
5. Braun-Menendez, E. and Martinez, C.: Major Frecuencia de hipertension por perinefritis o desoxicorticosterona en ratos diabetics. Rev. Soc. Argent. de biol. 25:162, 1949.
6. Davis, L. and Tanturi, C. A.: Liver as a Factor in Experimental Renal Hypertension A.M.A. Arch. Surg. 62:325, March, 1951.
7. Olsen, N. and Schroeder, H.: Pressor Substances in Arterial Hypertension. III Chemical Studies on Pherentasin, J. Exper., Med. 92:561, December, 1950.
8. Nickerson, M.: Role of Sympathetic Blockade in the Therapy of Hypertension. Am. J. Med. 8:342, March, 1950.
9. Hines, E. A., Jr.: Range of Blood Pressure and Subsequent Hypertension. J.A.M.A. 115:271, 1940.
10. Taylor, R. D., Page, I. H. and Corcoran, A. C.: A Hormonal Neurogenic Vasopressor Mechanism. A.M.A. Arch. Int. Med. 88:1, July, 1951.
11. Selye, H.: Textbook of Endocrinology, Ed. 2, Montreal, ACTA, Endocrinologica Inc., Medical Publisher, 1949.
12. Kezdi, P.: Sinoaortic Regulatory System. Role in Pathogenesis of Essential and Malignant Hypertension: Arch. of Int. Med. 91:1, 26-34, January, 1953.
13. Muller, J. M., Schlittler, E. and Bein, H. J.: Reserpin The Sedative Substance from R. Serpentina, Benth. Experentia, Vol. 8, p. 338, 1952.
14. Stutzman, J. W.: The Physiologic Effect of Rauwolfia Serpentina. Journal of Pharmacology and Experimental Therapeutics, to be published.
15. Wilkins, R. S. and Judson, W. E., The use of Rauwolfia Serpentina in Hypertensive Patients. New England J. Med. 248:48, 1953.
16. Aviado, D. M., Jr., Pontius, R. G., & Schmidt, C. F.: The Reflex Respiratory and Circulatory Actions of Veratridine on Pulmonary, Cardiac & Carotid Receptors. J. Pharm. & Exper. Therap. 97:420, 1949.
17. Gruzhit, C. C. & Moe, G. K.: Mechanism of Hypertensive Action of "Veriloid." Fed. Proc. 11:352, 1952.
18. Alexander, W. M., Richards, A. B., and Abreu, B. E.: Comparative Cardiovascular Activity of Three New Alkaloids of Veratrum Album. Fed. Proc. 12:297, 1953.
19. Rothlin, E.: The Pharmacology of the Natural and hydrogenated Alkaloids of Ergot. Bulletin de l'Academie Suisse des Sciences Medicales, 2, 4, 1946-47.

PRESENT CONCEPTS REGARDING GOITER

Herbert H. Davis, M.D.*
Omaha, Nebraska

Recent discoveries have caused greatly increased interest in the thyroid gland. In the past toxic goiter was diagnosed by symptoms and basal metabolic rate studies. Now the diagnosis may be much more accurate with the addition of protein-bound iodine of the blood and with radio-iodine tracer studies. In treatment, surgery is now being challenged by antithyroid drugs and by radio-iodine. There is still no unanimity of opinion regarding the treatment of various types of toxic goiters. I shall attempt to show you the reasons for each form of treatment in relation to thyroid physiology. Then you can use your judgement as to which form of treatment you wish to use on your patient.

*Presented at the Arizona Medical Association Meeting, April, 1953, Tucson, Arizona.

Goiters may be de to thyroid deficiency or to an excess of a thyroid stimulating hormone elaborated by the anterior lobe of the pituitary gland. The former is the case in colloid goiter and many nodular goiters. Excess thyroid stimulating hormone is probably the basis for Grave's disease, also called exophthalmic goiter or toxic diffuse goiter. The finest investigation regarding the role of iodine in the production of goiter was done by Marine and Kimball in 1921. Their study was on school children. In the control group of 2305, 495, or 21 per cent, developed goiter. By giving small doses of iodine to another group of 2,190 children, only five or 0.23 per cent developed goiter.

They then studied the use of iodine in the cure of goiter. As a control group of 1,048

children who had early goiter, with no treatment 145, or 14 per cent, decreased in size later. In a group of 1,182 children who were given iodine, 173, or 65 per cent, showed decrease in size. Iodine deficient goiters then may be produced by low iodine intake, use of thiocianate (cabbage), thiouracil-like compounds, sulfonamides, etc.

Thyroid stimulating hormones, formed by the anterior lobe of the pituitary, greatly stimulate the thyroid gland and increase the production and excretion into the blood of thyroxine, the active hormone of the thyroid. Thyroid stimulating hormone also at times will produce exophthalmos. Increase of this hormone may be produced by certain nervous stimulants from the higher brain centers, possibly by infections, and is inhibited by iodine or by thyroxine.

Physiology of Thyroid

The function of the thyroid gland is to selectively take up iodide from the circulation and to synthesize it to the active hormone thyroxine which it stores and excretes into the circulation as needed by the body. This hormone stimulates the metabolism of all the cells of the body. This process is not thoroughly understood. Based upon very extensive research which has been reviewed, the following impression of thyroid physiology may be given.

Iodine is quickly absorbed, mainly from the intestinal tract as iodide. It is taken mainly into the extracellular fluid. It is quickly selectively absorbed by the thyroid cells. A thyroid stimulating hormone (TSH) is secreted by the anterior pituitary. This hormone stimulates the thyroid cells to activity so they take up more iodide and more quickly synthesize thyroxine and excrete this hormone more rapidly into the circulation. Microscopically, this is shown by hyperplasia of the epithelium of the thyroid which becomes columnar in type with marked papillary infoldings to increase the amount of secreting epthelium. The rapid excretion of hormone results in decreased colloid in the follicles. The vascularity is greatly increased, and it resembles the thyroid of Grave's disease.

Excess dosages of iodine produce the opposite effect. The production of thyroid stimulating hormone (TSH) by the pituitary is inhibited so there is less activity of the thyroid. The cells become flat, the vascularity is decreased, and the follicles are full of colloid. The last finding is due to the fact that iodine inhibits the protease in the follicles so that the thyroid hormone is not liberated so well. The production of thyrotropic hormone is inhibited by the thyroid hormone. Thus the amount of thyroxine produced is regulated.

Tests for thyroid function to determine hyperthyroidism and hypothyroidism in order of their accuracy are as follows: (Table on bottom of page).

Unfortunately protein-bound iodine in the blood is a very difficult test to do and is not generally used. Radio-iodine uptake is much more commonly used. The somnolent metabolic rate may be extremely important to use, especially in extremely nervous individuals. We have not found the blood cholesterol too accurate.

Iodine

Iodine is necessary for the formation of the thyroid hormone thyroxine. It makes up to 65 per cent of the weight of thyroxine. Iodine is a trace mineral, which is a dietary essential in mammals. The total iodine of the body is about 50 milligrams, one-fifth of which is in the thyroid gland. Iodine is ingested in water, food and drugs. The optimal intake is only 100 to 200 micrograms per day. Lugol's solution (liquor iodi compositus) contains 6 mil-

TEST	NORMAL	HYPER	HYPO
Protein-bound iodine (PBI) of blood	3.5 - 8.0 mg. %	Over 8.0 mg. %	Under 3.5 mg. %
Radio-iodine (RAI)	15-35% in 24 hours	Over 40% in 24 hours	Under 10% in 24 hours
uptake in thyroid	6% an hr. 1st few hrs.	Over 6% an hour	Under 3% an hour
RAI excretion in urine	40-70% in 24 hours	10-30% in 24 hours	60-90% in 24 hours
Somnolent metabolic rate (SMR)	–20-0%	Over 0%	Under –20%
Basal metabolic rate (BMR)	–10 to +10%	Over +10%	Under –10%
Blood cholesterol	150-210 mg. %	Under 150 mg. %	Oper 210 mg. %

ligrams of iodine per drop. In other words, one drop contains 30 to 60 times the daily requirement of iodine. One gram of iodized salt contains 200 micrograms of iodine, which is the daily requirement.

The selective absorption of iodine by the thyroid is not understood. Marine and Lenhart demonstrated in 1909 that, when the iodine concentration of the thyroid fell below 10 milligrams per cent, hyperplasia of the thyroid and goiter developed. This may be caused by deficient iodine intake. The same effect is produced by taking thiocyanate, which prevents the selective uptake of iodide by the thyroid and causes the thyroid to give up inorganic iodide.

Antithyroid Drugs

Antithyroid drugs, such as propylthiouracil, produce a block of the enzyme systems which are necessary for the iodinization of the thyroid proteins. A physiologically inactive thyroid protein results. The action is much slower than that of iodine because there is no noticeable improvement until the previously stored thyroxine is all used up. This may take several months, especially if the patient has had iodine previously so that there is a great deal of this hormone stored. However, there is no refractoriness and the patient adequately treated never has postoperative exacerbation or crisis as there is very little thyroid hormone left in the gland to be liberated. Propylthiouracil may be given in daily doses of 200 to 400 mg. as tablets three times a day, as absorption and excretion is very rapid. Tapazole, another antithyroid drug, has a dosage of 20 to 40 mg. per day. If these drugs are given in adequate dosage and for a long enough time, relief of toxic symptoms practically always occurs. Unfortunately, if the drug is discontinued even after using it for a year or more, recurrences occur in about half the cases. It also has the disadvantage that some cases are toxic to the drug so that they have to be discontinued. The advantages are that they are cheap, may be given by the patient's home physician, and the patient need not stop work and go to the hospital.

Radio-Iodine

Tracer doses of I^{131} may be used in the diagnosis of thyroid activity and of the activity of certain thyroid carcinoma metastases. A dose of 50 to 100 microcuries in water is given by mouth. It is rapidly and selectively taken up by the thyroid. The more active the thyroid is, the more active and in greater quantities it is taken up. This may be measured by a Geiger-Mueller counter placed over the thyroid. Normal uptake is 6 per cent or less per hour the first few hours and is 15 to 35 per cent in 24 hours. A check on this is to measure the excretion of radio-iodine in the urine for 24 hours. Of the radio-iodine not retained by the thyroid, 80 to 85 per cent is excreted in the urine. Therefore, the more toxic the goiter is the more radio-iodine there is in the thyroid and the less in the urine. The opposite, of course, occurs in hypothyroidism.

In therapeutic doses, radio-iodine causes destruction of secreting epithelium of the thyroid gland. It is highly effective in decreasing thyroxine production. Dosage is figured on the size of the thyroid and its activity. It is better to give a little too small a dose to start with than too large a one, which might produce a permanent hypothyroidism. If after two months the patient is still toxic, another smaller dose may be given. This may be done a third time or until the thyroid is made normal. An objection is the theoretic danger of its producing carcinoma in the thyroid fifteen, twenty, or twenty-five years in the future. No one can predict just now because it has not been used long enough. Because of that theoretic danger, many people do not advise its use before the age of 45 or 50. This problem will have to be re-evaluated in another ten or fifteen years.

Surgery

Surgery will cure 85 to 95 per cent of toxic thyroid goiter. The results vary according to the skill of the surgeon. It is now advisable to prepare all of these patients adequately with iodine or one of the antithyroid drugs until the patient is euthyroid. Then for a couple of weeks iodine is used to produce involution and decrease the hemorrhage at operation. When patients are euthyroid before thyroidectomy is done, proper surgery results in a mortality of 1 in 1,000. Thyroidectomy has another very great advantage, and that is in cases where there is any suspicion of carcinoma, as the tissue is removed so it can be examined microscopically. Thyroidectomy is the only effective treatment when there are pressure symptoms.

XUM

Carcinoma of the Thyroid

Carcinoma of the thyroid gland is commoner than used to be thought. The majority of these develop on the basis of nodular goiter, usually non-toxic, and most commonly in a single nodule. According to various statistics, it occurs in 10 to 25 per cent of single nodules in the thyroid. Because of that, these nodules should be prophylactically removed. Carcinoma of the thyroid is not uncommon in children. About one-third of all nodular goiters in children are carcinoma.

Signs of carcinoma in the thyroid are a single, non-toxic encapsulated nodule, any nodule of recent development especially in children, accelerated growth in a thyroid nodule, a hard indurated area developing in an adenoma, a lateral aberrant tumor which is usually a metastasis to a cervical lymph node, fixation to adjacent structures, persistent hoarseness due to recurrent laryngeal nerve involvement, pain, dyspnea, difficult deglutition, and metastases especially to lungs and bones.

Any suspicious lesion should be operated upon and a microscopic section obtained. A lobectomy or nearly total thyroidectomy should be performed with a radical neck dissection to remove involved cervical nodes on the side involved. If both lobes are involved, a neck dissection on the less involved side may be done seven to ten days later. Roentgen therapy should be used usually postoperatively. Later a tracer dose of RAI should be given in an attempt to locate recurrence and metastasis. If these have adequate pick-up of the RAI, it may be given in therapeutic doses.

Fortunately the commonest types of carcinoma are the papillary and the adenoma with blood vessel invasion, as these are relatively slow growing. Contrary to the usual rule of carcinoma, these slow-growing types are the commonest carcinomas of the thyroid in children. The very malignant solid carcinomas are more likely to occur in elderly people.

Exophthalmos

Usually exophthalmos disappears or is greatly decreased following treatment of toxic thyroid goiter and consequent reduction of thyroxine in the blood. However, there is an occasional case of malignant exophthalmos in which the opposite occurs. This latter type is probably due to excess thyroid stimulating hormone of the pituitary. Then when the inhibition of thyroxine is decreased there is more excess of the thyroid stimulating hormone produced and, therefore, an increase of the exophthalmos. This type should be feared if exophthalmos is out of proportion to the degree of hyperthyroidism. In this case it is better to use some temporary form of treatment such as iodine or antithyroid drug. If the exophthalmos gets worse, this should be stopped. If on the other hand the patient has been treated with radio-iodine or thyroidectomy, then he will have to have large doses of thyroid extract given to inhibit the pituitary. These cases should be carefully watched as blindness may develop. If this progresses in spite of thyroid extract, some sort of decompression operation of the orbit should be done.

The subject of treatment is very complex, and in many instances there are several forms of treatment which give fairly good results. In the following there is no attempt to be dogmatic, but I am merely indicating my personal preference of treatment in the various forms of goiter.

My own opinions are as follows:

I Non-toxic diffuse goiter (colloid or simple goiter)
  Iodine in small doses (iodized salt)

II Non-toxic nodular goiter
  1. Single nodule – hemithyroidectomy to exclude carcinoma
  2. Multiple nodules – thyroidectomy

III Toxic nodular goiter
  1. Small
    A. Thyroidectomy
    B. Radio-iodine
    C. Antithyroid drugs
  2. Large
    A. Thyroidectomy

IV Toxic diffuse goiter (Graves' disease – exophthalmic goiter)
    A. Radio-iodine or thyroidectomy
    B. Anthythyroid drugs

V Carcinoma
  Thyroidectomy with unilateral or bilateral radical neck dissection. Later roentgen therapy or radio-iodine if functioning.

(Part II of a Three Part Article)

THE NEPHROTIC SYNDROME

Derrill B. Manley, M.D.
Medical Center, 1313 N. 2nd Street
Phoenix, Arizona

(Continued from November Issue)

A comprehensive report on the treatment of nephrosis with concentrated human serum albumin has been given by Luetscher, Hall and Kremer (17). Thirteen patients with the characteristic features of the nephrotic syndrome were treated. These included no patients with marked hypertension or renal insufficiency. Maximal diuresis was noted to occur in the first few days of treatment, so that if diuresis failed to appear in 3 to 5 days, treatment was stopped. If a good diuresis appeared, treatment was continued until the weight became stationary and/or edema disappeared. A rapid increase in plasma volume was noted following each injection of concentrated albumin. The plasma concentration of albumin increased most strikingly in the first two days of treatment but fell quickly when treatment was stopped. The change in the total protein was less striking and frequently negligible. Plasma volume and albumin concentration usually declined to the control level within a week or two. No fundamental change in the course of the disease was apparent after albumin therapy.

Farr (18) has reported that in experimental nephritis in rats, high protein intakes may favor the development of a chronic progressive fatal nephritis. Maximum intake of protein did not promote maximum assimilation. He found that in the average 5 year old nephrotic child, nitrogen assimilation reached a maximum on a diet furnishing approximately 3 grams of protein per kilogram of ideal body weight. On the average, 2.5 grams of protein per kilogram of ideal body weight were necessary to insure a positive nitrogen balance.

Addis (3) approaches the problem of protein intake in nephrotic patients from the standpoint of work performed by the kidney in metabolizing that protein. He maintains that all patients with the nephrotic syndrome should be treated as though they were in the degenerative stage of glomerulonephritis. The work of the kidney consists largely of excretion of urea, this being accomplished by tubular resorption of water from the glomerular filtrate in the tubule, leaving a high urea concentration. The work, therefore, is that of overcoming the osmotic pressure of the urea in the tubular contents. The only practical way to rest the kidney is to decrease the amount of urea which it must excrete, and to facilitate, if possible, the excretion of the necessary remainder. To do this, the protein metabolism of the body must be reduced to the minimum necessary for body growth and repair by means of a low protein diet. The urine should be dilute since this decreases the concentration of urea, and hence its osmotic effect. For this reason fluid should be moderately forced unless otherwise contraindicated. During the degenerative or the nephrotic stage, he advises a protein intake of 0.5 to 0.7 grams per kilogram of body weight daily plus the amount lost in the urine daily, which may be as much as 50 grams per day. The energy requirements are covered with carbohydrate and fat, which have the important advantage of sparing the protein. Since some of these patients show considerable fat intolerance, and carbohydrate has the greater protein sparing property, it is advisable to meet the energy requirements more largely through carbohydrate than fat, thus arriving at a low protein, high carbohydrate, medium fat diet.

Farr (19), and Farr, Emerson, and Futcher (20) administered casein hydrolysate intravenously to 25 nephrotic patients, with no demonstrable permanent effect on the concentration of the plasma amino acid or nitrogen in any of the patients studied. Farr felt that after amino acid injections, the capacity of nephrotic patients to assimilate high protein diets was markedly increased over the previously observed. There was no evidence that the intravenous administration of casein hydrolysate materially shortened the course of the nephrotic disease, significantly affected in a favorable manner the severity of the nephrotic signs or symptoms, or influenced the ultimate outcome favorably.

Killian demonstrated that some animals deprived of vitamin A developed edema, increased susceptibility to infection, albuminuria, and inversion of the serum albumin and globulin ratio. These findings were reversed by use of vitamin A and unsaturated fatty acids, with no other changes in the diet. Caldwell (21) treated a single case with large doses of vitamin A and unsat. fatty acids with success, but recorded period of follow-up was only 10 months.

Falkenstein and Jackson (22) have commented on acacia therapy in nephrosis. In 1933 Hartman and co-workers reported the successful use of acacia intravenously in treatment of children with nephrosis. Temporary improvement of edema and lowered serum proteins was obtained, the purpose being to increase the osmotic pressure of the blood to compensate for the decrease caused by the lowered serum protein. However, in 1935 several observers reported adverse effects of acacia on both humans and dogs. A marked lowering of serum proteins, and a deposition of acacia in liver, bone marrow, lymph nodes, lungs, kidneys and spleen were noted. It was concluded that the intravenous administration of acacia was contraindicated in nephrosis, and one thought that acacia actually damaged the liver.

The brevity of the interval since the introduction of adrenocorticotrophic hormone and cortisone in the treatment of the nephrotic syndrome prevents any conclusive remarks in this regard. The results in cases so treated at Children's Hospital will be mentioned.

VI. Laboratory — Some reports present conflicting data but in general, most workers are in agreement on the basic laboratory manifestation of the nephrotic syndrome. Gottfried, Steinman and Kramer (15) have found the total serum protein, serum albumin and albumin-globulin-ratio to be consistently low. Serum globulin values are normal or slightly decreased, fibrinogen values are usually elevated, and a correlation has been noted between the high fibrinogen value and the increased erythrocyte sedimentation rate in nephrotic patients. Some transient azotemia is observed. Uric acid values are essentially normal. Plasma amino acid nitrogen values are either normal or slightly elevated. Total lipids, especially cholesterol, are all considerably elevated. Phospho-lipid values are usually normal or slightly elevated. Serum calcium values are consistently low, probably related to the hypoproteinemia, but no clinical evidence of tetany was noted in any of their patients. Serum inorganic phosphorous values are essentially normal. Plasma chlorides and carbon dioxide content are essentially normal. Fasting glucose levels are normal or slightly elevated. Glycosuria was not seen in their patients. Vitamin A levels are elevated only moderately if at all. In most of their cases, carotene values were considerably above the normal range of 100 to 200 micrograms per 100 cc, and the elevation paralleled the degree of lipemia. Eight to ten patients showed some degree of hepatomegaly, but no frank jaundice was seen. Cephalin flocculation was 2 plus or more in six cases. Thymol turbidity values were greater than the normal of 5.0 units in all cases. Serum amylase values were below normal in some cases. Prothrombin time was significantly prolonged in only 2 cases. Sulfabromophathalein excretion was consistently normal. These findings were thought to suggest some inpairment of liver function in nephrosis.

Bradley and Tyson (6) found that albumin is always reduced, the globulin content increases, falls or stays the same, usually the beta globulin and fibrinogen increase, alpha globulin may rise and gamma globulin is almost always reduced. Normally, protein in urine does not exceed 9 mg. or a total of 150 mg. per day.

Wilson and Hadley (23) have noted that some children with the nephrotic syndrome excreted lysozyme greatly in excess of the normal of zero to 32 units of lysozyme per cc of urine, sometimes reaching levels as high as from 64 to 1,024 units per cc of urine. This was a constant finding in all children with the nephrotic syndrome. In general those patients with renal insufficiency tended to have fluctuating or persistently elevated excretion of urinary lysozyme. The degree of lysozymuria was not related to the severity of proteinuria or hypoproteinemia.

Flood and Pinelli (24) demonstrated a tremendous increase in the 24 hour urinary output of glycocyamine in seven children with the nephrotic syndrome, the value reaching more than 900% of that expected in the normal child.

VII. Pathology — The actual pathological

XUM

demonstration of the kidney lesion associated with the clinical diagnosis of lipoid nephrosis, or the nephrotic stage of chorinc glomerulonephritis, might be expected to resolve the argument as to whether the two are separate disease entities, or simply different stages or manifestations of the same disease. This, however, is not the case. Apparently there is general agreement on the presence and character of tubular involvement in the lipoid nephrosis patient, but whether or not glomerular involvement is permitted in such a diagnosis, and if any, to what degree, varies with practically every worker.

In 12 necropsies on children with the diagnosis of lipoid nephrosis, Schwarz, Kohn, Weiner (7) found that in seven children dying one year or less after the onset of symptoms, the glomeruli showed either no pathological changes or slight congestion of capillary loops. Five children dying one year or more after the onset of symptoms, revealed glomerular changes that could be divided into two groups: (A) Glomerulonephritis with some interstitial scarring and obliteration of some glomeruli, but not as extensive as in typical progressive glomerulonephritis, and (B) Definite thickening of some of the glomerlar sules. All 12 showed swelling and vacuolation of the lining cells of the convoluted tubules.

Block, Jackson et al (4) obtained 10 necropsies. In only four or five was microscopic hematuria seen during life. Minor glomerular changes, such as a few glomeruli with hyalinization, a few crescents, a few adhesions between tuft and capsule were seen in the kidneys of four children not known to have had hematuria. They concluded that there is little if any relationship between the degree of microscopic hematuria and permanent glomerular damage in lipoid nephrosis. The glomerular changes appear to be of minor significance in most instances. When discussing the prognosis of a nephrotic child, it should be remembered that nephrosis at times may terminate as nephritis, with persistent azotemia and a fatal outcome. Months or years may be required to decide whether a case of lipoid nephrosis will remain as such or if signs of chronic nephritis are developing. Since the etiology of nephrosis is unknown, dogmatism should be avoided in discussing the nephrosis-nephritis problem. These authors found degeneration of renal tubules in all cases autopsied.

In discussing a case of lipoid nephrosis (25), Mallory described the kidneys as being greatly enlarged to three times that of normal, surfaces were pale and smooth, and focal yellow spots were scattered irregularly over the entire cortex. On the cut surface the cortex was very pale and rather mottled. Bright yellow streaks could be made out in the pyramids. The gross appearance made it evident that there must have been a great deal of lipid in the kidneys.

Bradley and Tyson (6) feel that regardless of etiology, proteinemia in the nephrotic syndrome is attributable to defective glomerular activity. However, in contrast to chronic glomerulonephritis and intercapillary glomerulosclerosis, the glomeruli in kidneys of patients, usually young children, dying during the course of lipoid nephrosis present only a few or no alterations, and the tubular pathology is almost always outstanding, after the disorder is well established. Fatty and colloid substances appear as droplets or vacuoles in the tubule cells, particularly in the proximal segment. Nearly all the cells in this part of the nephron may be filled to bursting with brightly refractile fat. The deposit is distributed irregularly, and groups of grossly swollen cells bulging out through the basement membrane may give rise to distortion of the tubules. In many places the nuclei are pyknotic, and there may be necrosis and desquamation of portions of the tubular epithelium. As a result of these changes, which occur in every type of the nephrotic syndrome, the kidneys become large, pale, and rather yellowish and firm, but not fibrotic. A few microscpoic scars may be seen scattered through the parenchyma, to a greater extent perhaps in the nephritic and amyloid forms, but rarely sufficient to cause grossly detectable fibrosis or contraction.

Heymann and Startzman (11), in studying 34 children with lipemic nephrosis, obtained six autopsies. Three deaths occurred less than six weeks after the onset of symptoms. The glomeruli in all cases were normal, and the basement membranes were not thickened. They concluded that anatomically, lipemic nephrosis is a non-inflammatory lesion of the tubular apparatus, often being present without micros-

copic evidence of glomerular or interstitial inflammation.

VIII ANALYSIS OF CASES

The doctor, in whose hands is placed the responsibility of caring for the nephrotic child, will inevitably be asked by the anxious parents what the ultimate outcome of the disease will be. Until the child has been thoroughly evaluated from the clinical and laboratory standpoint, and observed over a resonably prolonged period of time, even a qualified answer to that question cannot be given. Should the unmistakable evidences of nephritis become manifest, it would seem assured that a fatal outcome will ensue, but again the time of that unhappy result is subject to considerable variation. The great question mark lies in the child who presents the components of the nephrotic syndrome, without a previous history consisten with nephritis, and, under initial observation, fails to show any of the clinical or laboratory indications of nephritis. Is this so-called pure or lipoid nephrosis? or is it merely an unusual introduction to nephritis, the clinical and laboratory proof for which will become obvious if the child is followed carefully and for a long enough period of time?

Forty-five cases, selected from the Denver Children's Hospital records of the past decade, are herein analyzed. Each case presented originally as the nephrotic syndrome, cause undetermined, and initial work-up failed to reveal evidence of nephritis. The analysis is so-conducted as to provide a record of laboratory changes, treatment, effect of infections, and finally, the present status of each case, with particular attention being given to a comparison of pathological impression and clinical impression in each autopsied case.

A. The age of onset of the disease varied from 14 to 186 mos., or 15.5 years. The average age of onset was 52.7 months.

29 of the cases were males, 16 were females, 44 were white, 1 was oriental.

B. The first sign or symptom in 29 cases was facial edema. In 14 cases it was generalized edema. In the remaining 2 cases, scrotal edema, and emesis and fever, respectively, presented first.

Edema recurred from 1 to 26 times in the course of each individual patient, varying from 1 to 4 plus.

1 patient's retinas showed slight A-V nicking. Other than that, no retinopathy was found.

Hypertension was present 1 or more times in 33 cases. 11 had it on 1 occasion, 8 had it on 2 occasions, and 14 had it on 3 or more occasions.

Weight gain during onset or exacerbations of the disease ranged from 1 to 27 pounds.

Ascites was present in all 45 cases, 1 or more times, from 1 to 4 plus.

Hydrothorax occurred in 9 cases, with 1 being bilateral.

A definite allergy, such as asthma, hayfever or eczema, was noted in 7 cases.

C. The number of hospital admissions for any 1 patient varied from 1 to 28, with an average of 4.3 admissions per patient. The admissions were each from 1 to 258 days in length. The average length of hospital stay of patients admitted prior to the institution of ACTH and cortisone therapy was 21.0 days. The average length of stay of patients given this therapy was 16.0 days.

Concerning the effect of infections on the nephrotic syndrome, 81 upper respiratory tract infections were recorded in 28 patients. The remaining 17 patients either had no such infections, or they were not noted in the hospital record. Other infections encountered were: otitis, pneumonitis, cellulitis, infectious mononucleosis, chicken pox, bronchitis, meningitis, gastro-enteritis and others. Significantly, no remissions followed or could be attributed to any of these infections. However, a total of 39 exacerbations or worsening in symptoms occurred simultaneous with, or shortly after, the appearance of the infection. These exacerbations lasted from 1 to 38 weeks. The average duration of an exacerbation following infection was 12.1 weeks.

Measles developed in 8 patients during the course of their disease. Six patients, remarkably, had total symptomatic and laboratory remissions. Another patient had a total symptomatic and laboratory remission, but had received a course of ACTH therapy just prior to the appearance of the measles. The onset of each remission occurred from 3 to 12 days after the rash appeared. Two of those having remissions had recurrences of the nephrotic syndrome in less than six months. The remaining five patients have been in remission for six months, seven months, 28 months, 3¼

years, and five years, respectively, to the time of writing.

A total of 24 courses of ACTH were given to 14 patients included in this report. The dosage varied, usually being 10 to 20 milligrams every six hours, for 6 to 10 days, with the total amount of drug varying from 200 to 1200 milligrams per course. Fifteen remissions, including one symptomatic and 14 symptomatic and laboratory remissions, were induced in 10 patients. The onset of these remissions came from four to 15 days after the treatment was begun, and the duration of each ranged from 1 to 39 weeks, with the average remission being 8.8 weeks in length. However, two patients were still in remission at the time of writing, and the duration and final outcome of these, obviously, cannot be determined. Seven courses of ACTH were followed by diuresis and symptomatic improve-

SERIES	FACTOR	Result			
		Remission	Improved	No Change	Exacerbation
Denver Children's Hospital (45 cases)	Infection other than measles (81 infections)	0%	--	52%	48%
	Measles (8 cases)	87.5%	–	12.5%	0%
	Spontaneous (93 episodes)	63%	–	–	37%
	ACTH Treatment (24 cases)	62.5%	29%	8.5%	0%
Boston Children's Medical Center (1) (208 cases)	Infection other than measles (383 infections	24%	–	26%	50%
	Measles (14 cases)	79%	–	21%	0%
	Spontaneous	99 remissions in 180 patients	–	–	–
Measles cases in Nephrotic Syndrome, collected from literature. (21 cases)	Measles (21 cases)	38%	48%	4.5	9.5%

Table I – A comparison of changes wrought in nephrotic children by disease and other factors. The relative superiority of measles in producing a favorable change seems apparent.

Author: Derrill B. Manley, M.D.

XUM

ment, but could not be classified as remissions. Two courses were followed by no response at all.

Only four courses of cortisone therapy were given to two patients. One remission resulted, lasting for 12 weeks. Three courses were followed by no response.

In no case did treatment with ACTH or Cortisone result in an exacerbation or worsening of the disease.

An effort was made to catalogue remissions either beginning spontaneously or following conventional treatment with plasma, paracentesis, diuretics and other agents. A total of 59 such remissions occurred in 21 patients, with an average of 2.8 remissions per patient. The duration of remission varied from 1 to 130 weeks, with the average being 20.3 weeks. Again, however, eight of these patients were still in remission at last report.

Thirty-four exacerbations occurred spontaneously, without any apparent precipitating factor, in 14 patients. These lasted from two to 104 weeks, with the average being 18.5 weeks.

D. Regarding the status of these cases at the time of writing, two had been continuously ill from the time of onset of their disease, one had been in exacerbation the preceding five months, and four had been alternately in remission and exacerbation so frequently that their condition was indefinite. Sixteen patients were in remission. Of the 16, four remissions followed measles, two followed ACTH therapy, one followed ACTH therapy and measles, and one, peculiarly enough allegedly followed a severe episode of bronchopneumonia which occurred at home some 6½ years ago. The remaining eight patients developed their remissions spontaneously or following treatment with agents other than the steroids, these remissions varying from 12 months to five years in length.

Fifteen of the original 45 patients are dead, after experiencing none to seven remissions, and none to eight exacerbations. Each fatal case had an average of 1.0 remissions and 1.1 excaberations before death. The duration of the disease prior to death varied from 10 weeks to four years, with an average of 79.1 weeks. The clinical cause of death, in 10 cases, was variously given as acute pulmonary edema, pneumococcal peritonitis and septicemia, pneumococcal meningitis, bronchopneumonia, cardiac failure, uremia, and pericarditis. In five cases it was not given. Seven autopsies were obtained. In eight cases no autopsies were obtained, six of these dying outside the hospital.

No recent information is available in seven cases.

* * *

This is the second section of a three part article. The third section of this article will appear in the January, 1954 issue.

PHOENIX *Clinical* CLUB

MASSACHUSETTS GENERAL HOSPITAL CASE RECORD NO. 37301

The Case History in this discussion is selected from the Case Records of the Massachusetts General Hospital, and reprinted from the New England Journal of Medicine. The discussant under Differential Diagnosis is a member of the staff of the Massachusetts General Hospital. The other discussants are members of the Phoenix Clinical Club.

First admission. A sixty-five-year-old woman was admitted to the hospital because of arthritis, faintness and chest pain.

Six years before entry the patient had an episode of pain, swelling and redness involving numerous joints, particularly those of the fingers, and the elbows, shoulder, hip and knees. Similar attacks had recurred over the years, leading to deformities that were most marked in the hands. About two years before admission the patient noted weakness and easy fatigability. A diagnosis of anemia was made and she was treated with iron and liver, but despite this therapy she became progressively weaker. One year prior to entry she had a sudden attack of severe chest pain localized anteriorly in the region of the left lung base, markedly aggravated by breathing. She developed dyspnea and fever but no cough, cyanosis or hemoptysis. These symptoms subsided over a period of a week, during which time she was confined to bed. There had been several similar episodes since that time.

During the past year she had also noted a rash over the nose. Two weeks before entry she developed a symmetrical non-pruritic rash over the forearms, chest, buttocks and feet. Her appetite had become progressively poorer during the last two years of her illness, and she had lost thirty-three pounds in weight. Additional symptoms, not definitely dated in onset, were soreness over the entire skull, intermittent eyeball pain, loss of hair of the head, appearance of "small lumps in her lips lasting one to two days," a nonproductive morning cough, a sensation of choking toward the end of meals, dizziness even while in bed, four-times nocturia and numbness in the shoulders. Symptoms had been persistent and moderately aggressive. The patient had taken many medications but did not know the nature of any.

The patient was married and had two children. The family history was negative and there was no history of exposure to poisons.

Physical examination revealed maculopapular eruptions on the nose and extensor surfaces of the forearms, knees and tibias. There was tenderness over the scalp. The axillary and supraclavicular lymph nodes were palpable, enlarged and rubbery. The lungs, heart, and abdomen were negative; the liver and spleen were not palpable. The hands showed arthritic deformities and there was limitation of motion in the elbows and temporomandibular joints.

The temperature, pulse, and respirations were normal. The blood pressure was 110 systolic, 75 diastolic.

The urine had a specific gravity of 1.020 and gave a 3 plus test for albumin; the sediment contained 2 red cells, 2 white cells, and no casts per highpower field. Examination of the blood revealed a hemoglobin of 8 gm. and a white-cell count of 3500, with 68 per cent neutrophils; the red cells were normochromic and normocytic. The total protein was 5.87 gm., the albumin 2.85 gm., the globulin 3.02 gm., the nonprotein 40 mg., the sugar 97 mg., and the uric acid 4.2 mg., per 100 cc. The prothrombin time was 18 seconds (normal, 17 seconds).

In the hospital the patient showed little change clinically. A phenolsulfonphthalein-excretion test produced 25 per cent in one hour and 35 per cent in two hours. A urine-concentration test showed specific gravities of 1.010, 1.010, 1.015, and 1.012. A urine-urobilinogen determination could not be carried out because of the presence of albumin. Wintrobe studies disclosed a red-cell count of 4,300,000, a hematocrit of 22, a hemoglobin of 7 gms., a mean corpuscular volume of 51 cu. microns, a mean corpuscular hemoglobin of 17 micromicrogm, and a mean corpuscular hemoglobin concentration of 31 per cent. A Congo red test showed 77 per cent retention in the serum; the blood cholesterol was 172 mg. per 100 cc., and the sedimentation rate 1.94 mm. per minute. An electrocardiogram was within normal limits. A roentgenogram of the chest showed a few scars in the lungs and a few calcified lymph nodes. There was thickening of the pleura in each costophrenic angle or possibly some fluid. The heart was generally enlarged and the aortic knob was calcified. X-ray films of the hands and wrists demonstrated narrowing of most of the interphalangeal joint spaces and proliferative changes about the margins. The bones were decalcified. An x-ray film of the skull and a plain film of the abdomen were negative.

Treatment consisted of blood transfusions and supportive therapy, and the patient was discharged at her own request on the seventeenth day. Numerous urinalysis disclosed a specific gravity ranging from 1.013 to 1.022 and 2 plus to 4 plus tests for albumin; a few sediments contained occasional granular or hyaline casts. The white-cell count never rose above 5200, but the blood hemoglobin was elevated to 12.5 gm. after transfusions.

Second admission (three and a half months later). In the interval the patient had pursued a rapidly downhill course characterized by headache, vomiting preceded by marked nausea, generalized itching and decreased vision. Her appetite had been poor. She had nocturia, insomnia and a cough productive of whitish sputum. Chest pain of pleuritic character had become more or less constant, and during the last few weeks she had remained in bed much of the time.

On physical examination the patient responded somewhat slowly. The left pupil measured 3 mm. in diameter, the right 2 mm.; both reacted promptly to light and on accommodation. The disk margins were blurred and showed recent hemorrhages bilaterally. On the right there was extensive fluffy exudate and

XUM

on the left extensive thrombosis of veins and arteries. There was some puffiness about the eyes. There were palpable small lymph nodes in the cervical, axillary and inguinal areas. The lung bases showed decreased resonance with a few inspiratory rales on the right. The heart rate was 84, with many ventricular premature beats. The point of maximum impulse was 1 cm., to the left of the midclavicular line. The pulmonic second sound was louder than the aortic. There were blowing Grade I to II apical and pulmonic murmurs. The liver was 2 fingerbreadths below the costal margin and slightly tender. The spleen was not palpable. There was 1 plus sacral edema and 2 plus edema of the legs extending up to the knees. An erythematous maculopapular rash was present over the back, arms, nape of the neck and bridge of the nose.

The temperature, pulse and respirations were normal. The blood pressure was 195 systolic, 90 diastolic.

The urine had a specific gravity of 1.011 and gave a 3 plus test for albumin; the sediment contained 2 to 5 white cells, 15 to 20 red cells and a few granular and hyaline casts per high-power field. The hemoglobin was 8.0 gm. and the white-cell count 3900, with 82 per cent neutrophils. The blood sugar was 89 mg., the total protein 5.18 gm., the albumin 2.28 gm., the globulin 2.90 gm., and the nonprotein nitrogen 62 mg. per 100 cc.; the sodium was 136.0 milliequiv. the chloride 75 milliequiv., the potassium 5.2 milliequiv., and the carbon dioxide 15.9 milliequiv. per liter. An electrocardiogram showed nonspecific T-wave changes. An x-ray film of the chest showed essentially the same findings as at the time of previous admission.

The patient was treated with cortisone, 100 mg. per day, for three weeks, during which time she had less itching, no vomiting, a better appetite and a sense of well-being. The nonprotein nitrogen, however, continued to rise despite this therapy; because of this the cortisone administration was stopped. It was believed that the patient was approaching renal failure and that little could be done for her. She was discharged on the thirty-eighth hospital day.

On returning home the patient continued on a downhill course, with intermittent itching and vomiting and increasing weakness. She also developed cough, orthopnea and hemoptysis, raising clots up to teaspoonful size. Death occurred during a coughing paroxysm about three weeks after discharge.

Dr. LESLIE B. SMITH

The most striking feature of the case for discussion is that the disease involved many systems. It was a generalized systemic process. The patient had had recurrent deforming arthritis for many years, she had recurrent pleuritic pains for one year, and x-rays showed thickening of the pleura. The kidneys were involved as shown by the nocturia, albumin in the urine, a PSP of 25 per cent in one hour, and there was inability to concentrate, the NPN was 62 mgm. per cent, acidosis was present with a CO_2 15.9 milliequiv. per liter. There was edema of the eyelids and there were 10-15 red blood cells per high power field in the urine. The heart was enlarged, there was a murmur, and heart failure was present. There were non-specific T wave changes shown on the electrocardiogram. Involvement of the nervous system was manifested by unequal pupils, blurring and choking of the optic discs, and neuritic pains over the scalp and shoulders. The eyes showed, in addition to the blurring, recent hemorrhages, fluffy exudates, and extensive thrombosis of the veins and arteries. There were enlarged rubbery lymph nodes. The hematopoietic system was affected and there was a neutropenia of 3,500 cells per cubic centimeter, and the hemoglobin was 8 grams per 100 cc of blood. Liver pathology was indicated by reversal of the albumin-globulin ratio (alb. 2.8 and glob., 3.02).

She had had a rash over the nose for a year and there was a nonpruritic rash over the forearms, chest, buttocks, and the feet. This type of generalized disease is very likely due to diffuse collagen disease. The skin lesions plus the neutropenia make the diagnosis most likely that of chronic disseminated erythematosus.

Chronic systemic lupus erythematosus may be present for ten or more years, with exacerbations and remissions, with varying degrees of activity in various organs. Archie H. Baggenstoss of the Mayo Clinic recently wrote "Acute disseminate lupus erythematosus is a systemic disease in which anatomic lesions are found predominently in the kidneys, heart,

spleen and lungs. Any organ, however, may be involved, particularly in its vascular or supporting components. Although involvement of collagen and intercellular ground substance plays an important part in the development of many of the lesions, cellular changes, particularly in the kidneys, may occur, run their course, and lead to death without demonstrable involvement of the collagen. Consequently, in the present state of knowledge it would probably be unwise to circumscribe the disease by the term "diffuse collagen disease".

The lesion which has been interpreted as pathognomonic of lupus erythematosus is the so-called wire-loop lesion in the kidneys and occurs in about 60 per cent of the cases, but it may occur in eclampsia, scleroderma, malignant nephrosclerosis, focal glomerulonephritis, and in diffuse glomerulonephritis. There may be proliferation of the endothelium of the glomerular capillaries or focal necrosis of the glomerular tufts. Renal tubular changes are not prominent until the glomerular changes are advanced. Renal insufficiency occurs in about 40 per cent of the cases.

Diffuse or focal fibrinous pericarditis occurs frequently. This process may extend beyond the pericardium. The choking on swallowing present in this case may be evidence of such an extension into the mediastinum. The endocardium is the site of nonbacterial, verrucous endocarditis in about 40 per cent of the cases. The murmurs which developed in this case were probably due to such an endocarditis. The myocardial lesions usually reveal fibrinoid degeneration of the interstitial collagen fibers, usually with a moderate exudative reaction.

The peculiar periarterial fibrosis about the central arteries of the spleen has been considered to be almost pathognomonic of lupus erythematosus. Pulmonary lesions occur frequently, although none of these lesions are pathognomonic. Pleurisy, interstitial pneumonitis and alveolar hemorrhages occur, all of which were present in the case under discussion. The neurologic lesions are predominantly vascular in origin, there is fibrinoid degeneration of the media, demyelinization, degeneration of nerve cell, and edema.

Adenopathy occurs in about 50 per cent of the cases of disseminated lupus – present in our case. Depression of the bone marrow is frequent and in this case there was neutropenia and anemia, but thrombocytopenia was not recorded. The reversal of the albumin-globulin ratio occurs frequently and may represent liver damage. This was present in this case, as was fever, which is also common.

The L. E. cell phenomenon, discovered by Hargraves, is the most diagnostic finding for disseminated erythematosus. These cells may be demonstrated in the peripheral blood or in the bone marrow. I am at a loss to know why there is no mention of a search for L. E. cells in this protocol because this test was known to them, in that the patient was treated with cortisone, which dates it since the discovery of the L. E. phenomenon. I will assume that this information was intentionally omitted to stimulate our mental processes.

Henry E. Michelson, University of Minnesota, has classified lupus erythematosus as follows: 1. Acute localized, edematous type; 2. Chronic discoid type; 3. Chronic disseminated type; 4. Subacute disseminated type; 5. Acute disseminated systemic and septic type, and 6. Protracted systemic type.

There is no specific treatment for this disease. Para-amino benzoic acid, cortisone and ACTH are being used with varying claims, but there is no cure. Gold, writing in Lancet, 1951, has intimated that there may be some etiologic relationship between the use of penicillin or sulfonamide medication and disseminated lupus erythematosus. This is so likely that he recommends that these drugs not be used in the treatment of this disease.

There have been several cases reported recently in which the pathologic lesions of two or more of the collagen diseases were present in the same patient, hence they cannot always be distinguished even by the pathologist.

Diagnosis: Chronic disseminated lupus erythematosus involving the joints, pleura, lungs, heart, pericardium, mediastinum, skin, nerves, brain, eyes, liver, bone marrow, and kidneys. Death was due to renal failure. Even though the Congo Red test was normal there is a possibility that this patient also had amyloid disease which may occur in this disease.

Dr. FRANK J. MILLOY

When our case for today is viewed in retrospect we have a chonically ill 65 year old woman who suffered from a gradually pro-

XUM

gressive, downhill illness, which ended in death after 6 years, in spite of many attempts to change the course of her illness. The first four years of her illness seemed to be quite typical of rheumatoid arthritis. But during the next two years the train of symptoms which finally sent her to the hospital, increased and progressed in frequency and intensity. She died suddenly during a paroxysm of coughing so that she must have suffered a cardic death.

On first admission to the hospital physical examination did not reveal any abnormality of the heart. But three and a half months later, at the second admission, examination revealed blowing grade 1 to 2 apical and pulmonic murmurs. And there were many premature ventricular beats. With her history of recurrent attacks of chest pain and joint pains and temperature and secondary anemia and gradually progressive weakness, all of which suggest some type of infection, subacute bacterial endorarditis immediately presents itself. The liver was two fingerbreadths below the costal margin ant there was evidence of peripheral edema, all indicating impending acute congestive heart failure.

The urine showed 3 plus albumin, the blood pressure was 195, the NPN was 62 mg., there were eye ground changes, the CO_2 combining power had dropped from a normal of 24-28 milliequiv., per liter to 15.9 milliequiv., indicating impending acidosis. And all pointing to severe renal failure caused by either an acute nephrosis, or a subacute or acute disseminated glomerular nephritis.

The protocol states that the patient was placed on cortisone 100 mg. per day but because the NPN was increasing this was discontinued. This is an interesting observation when we review the symposium on cortisone treatment in the November 29th issue of the AMA. Although his conclusions are based on observations in children, Riley of New York states that remissions in the nephrotic syndrome do occur when treated with cortisone. But he does warn that depression of renal function as one of the principal dangers of this form of treatment.

In spite of all this positive evidence of a diagnosis of either subacute bacterial endocarditis, or an acute or subacut nephrosis, or nephritis, I doubt that this patient has either of these conditions in a primary form. I think that the heart murmurs are probably hemic in origin resulting from the severe secondary anemia, and the pathologist will probably report normal heart valves. I think her train of symptoms are due to a profound toxemia produced by some other primary disease.

Our attention is next attracted to the palpable lymph nodes in the cervical, axillary, and inguinal regions, and the maculopapular rash over the bridge of the nose and over the back, arms, legs, and neck. The first condition which presents itself when we have generalized adenopathy is Hodgkins' Disease. I believe Hodgkins' Disease is discussed more frequently in this club than any other single disease. It was very thoroughly discussed last time just a month ago. There are a number of findings here in addition to the generalized adenopathy to suggest such a diagnosis. Namely the six year period of illness, the bouts of temperature, the uninterrupted, progressive downhill course, the fatal termination in spite of any form of treatment, the profound toxemia, the severe secondary anemia with a persistent leucopenia of three to four thousand white cells which is so common in the terminal stages of the disease, and even the skin eruption. They were looking for positive evidence of Hodgqins' Disease in the hospital. The Congo Red test was done. This showed 77% retention of the dye in the serum. This is normal. In Hodgkins' Disease and especially if much amyloid degeneration has taken place there is rapid disappearance of the Congo Red dye from the blood serum. It is absorbed by the amyloid. As much as 80% will disappear in twenty minutes. But for some unexplainable reason it is said to disappear quickly from the blood serum sometimes in Hodgkins', even if there is not much evidence of amyloid. In Hodgkins' urobilinogen sometimes appears in the urine. They were unable to carry out this test, however, due to excess albumin in the urine. There are several findings in this clinical course against the diagnoses of Hodgkins'. The temperature rises during the illness were not the typical relapsing Pel-Ebstein temperature rises. While generalized adenopathy was present, the lymph glands remained small and did not mat together as they so commonly do in Hodgkins'. Although many patients die of the abdominal form of Hodgkins', namely malignant lyphoma without a semblance of vis-

ible lymph adenopathy. The liver became enlarged and palpable, but the spleen was never felt below the costal margin. I do not belive this patient had Hodgkins'.

The next condition which presents itself for consideration here is disseminated lupus erythematosis. This clinical entity is defined as among that heterogenous group of so called rheumatoid diseases, which is often distinguished by a prolonged downhill clinical course and terminates fatally, that has a striking predilection for young females, and produces characteristic pathologic changes in the vascular system. It is a disease rarely encountered in private practice. In 1935 Baehr, Klemperes, and Schifrin collected twenty-three cases, twenty-two of which were in females, eighteen were in the second and third decades of life, all but one between puberty and menopause, the youngest being 7 years and the oldest forty-five. Our patient for discussion today was 65. The fact that she developed typical rheumatoid arthritis during the early years of onset fits today's case. Disseminated lupus is often ushered in by pulmonary episodes of fever, coughing, chest pain and small amounts of pleural effusion. Our patient had several of these episodes the year preceding entrance to the hospital. Most athorities emphatically state that there is no connection between the disseminated type of lupus and the simple dermatological entity known as lupus erythematosis or discoid lupus, which is a skin eruption that usually appears over the bridge of the nose and out across the cheeks. But a skin eruption may or may not be present in the disseminated type. When it is present it often occurs across the bridge of the nose as it did in this woman, and spreads to the chest, back, or extremities. The eruption is described as a maculo-papular erythema which may or may not itch. Anatomically there is widespread destruction of the collagen which is the matrix or binding substance in the connective tissue which surrounds the small blood vessels and capillaries of the body. This destructive process may spread to the areas of connective tissue which lie underneath the mucus membranes of all the internal organs as well as the intima of the larger blood vessels. Hence the characteristic vascular changes. Both pericardial and endocardial involvement is common. In about 30% of cases examined grossly, the endocardium exhibits pathogenic lesions first described by Lebman and Sachs as endocardial vegetations which may be small and verrucous, or large and flat. They usually occur on the valves but may spread all over the endocardium.

The kidneys are generally large and smooth. They are a common site for the areas of focal necrosis which are so pathogenic of disseminated lupus, but which may occur in all the internal organs, the lymph glands, and the blood vessels.

The December issue of Annals of Internal Medicine reports a case of acute disseminated lupus erythematosis in a 52 year old colored male with autopsy findings. They summarize the literature as follows: Vessey and Nelson reported a case in a 23 year old negro male with autopsy findings, which was the first report of the acute form in a colored male recorded in North American literature.

Paster, Sloan, and Goldburgh reported necropsy findings in five male patients with the acute form, two of whom were colored, one 12 years of age and the other 30. During the years 1935 to 1950, 12 patients with acute disseminated lupus were autopsied at the Medical College of Virginia. Five were white females, six were negro females, and one was a white male. The following conclusions seem to be universal:

"At the autopsy table, the frequent paucity of severe, gross anatomic changes, and the absence of a distinctive lethal lesion, is in striking contrast to the profound toxemia and the train of clinical events leading to the death of the patient."

The case reported in the Annals of Internal Medicine is from the Medical School of Virginia. Their pathology department report a typical lupus rythematosis cell demonstrated in the bone marrow. So accordingly a diagnosis is possible by performing a sternal puncture.

On account of the skin manifestations, the generalized lymph adenopathy, and the multiplicity of symptoms, a number of other conditions are suggested in today's case, namely Boeck's Sarcoid, mycoses fungoides, pariartentis nodosa, aleukemic leukemia, and several lymphoplastic entities, but none of them fit the history given today.

The progressive development of rheumatoid arthritis, the epsodies of pleuritic attacks with

pain and fever, the small amounts of pleural fluid, the evidence of myocardial, and endocardial involvement in the presence of a normal E.K.G., the constant and prolonged albuminuria which has resulted in an inversion of the A-G Ratio, the signs of impending renal failure, the skin manifestations, and the profound toxemia suffered by the patient make a diagnosis of disseminated lupus erythematosis almost mandatory.

DIFFERENTIAL DIAGNOSIS

This patient for four years had episodes of polyarthritis without much evidence of systemic disease, and then two weeks before admission there was a change.

May I see the x-ray films, Dr. Wyman? I presume the x-ray films of the skull were taken to rule in or out multiple myeloma which, of course, has to be thought of in joint disease, with a high sedimentation rate and anemia. I think that many of us have missed a diagnosis of multiple myeloma because there was no Bence-Jones protein in the urine or no plasma cells were seen in the peripheral blood.

Dr. Stanley M. Wyman: The films of the chest in the first examination demonstrate what I think is probably a small quantity of fluid in the pleural space, rather than thickened pleura. The heart shadow is large but shows no characteristic configurations. I wonder how much of the enlargement is due to the heart itself and how much to fluid in the pericardium. There is a definitely calcified aortic arch. The lung fields are not grossly remarkable. The films of the skull show no localized disease. The joint spaces of the hands and wrists are narrowed, as recorded, the most pronounced changes being about the terminal interphalangeal joints, with considerable hypertrophic changes; in addition there is rather severe osteoporosis. The arthritis type seems to be mixed – rheumatoid and degenerative. I would wonder, from the films alone, about psoriatic arthritis.

Dr. STILLMAN: The terminal phalanges are involved in rather destructive change. The index finger shows the classical deformity of rheumatoid arthritis, with flexion of the proximal joint and extension of the terminal one, but it is rather difficult to be sure of the type of arthritis from the x-ray film alone.

Dr. WYMAN: There is some abnormality of the index finger, which may be due to an old injury or may be congenital. The later films of the chest show essentially the same findings as previously, except that there is more fluid in the pleural space and atelectasis or possibly some pneumonitis in the left lower lobe. The later films of the skull demonstrate no definite localized changes.

Dr. STILLMAN: In attempting to unravel these knotty problems it is generally a good principle to try to explain all the symptoms and signs of the patient's illness on the basis of one disease, lupus erythematosus. I am unable to explain the case entirely on the basis of disseminated lupus erythematosus.

In the first place, let us consider rheumatoid arthritis. Could that conceivably explain this patient's whole illness? The clinical course, certainly the first four years of it, sounds rather like rheumatoid arthritis – the widespread joint involvement, the episodic nature of the disease and the development of permanent deformities. Then the disease changed its course and the patient went steadily downhill. Certainly one sees in rheumatoid arthritis patients who run very malignant courses, with fever, serous-surface involvement and cardiac damage. They can develop various types of renal disease – amyloid disease, pyelonephritis or glomerulonephritis. One could even account for the rash on the basis of rheumatoid arthritis, but the leukopenia cannot be fitted into this diagnosis. I should like to persist in my belief that the first four years of the patient's illness were different from the last two, and I should like to believe that she had rheumatoid arthritis during the first part of the illness and then developed something else.

What part of the symptom-complex that this patient showed could lupus erythematosus have explained? Certainly it could have accounted for the systemic signs of weakness, weight loss, fever, anemia and lymphadenopathy and could have accounted for the marked chest pain, which is common with involvement of the serous surfaces. The distribution of the rash was certainly consistent with disseminated lupus. The rash as described certainly does not sound like psoriasis, although the involvement of the terminal phalanges makes one think about it. Disseminated lupus would also explain the kidney damage demonstrated during the first hospital admission. It is ra-

(The Council on Pharmacy and Chemistry of the American Medical Association has adopted the following statement which appears in New and Nonofficial Remedies, 1953, Philadelphia, J. B. Lippincott Company, pp. 171-173, 1953.)

METHANTHELINE BROMIDE.—*Banthine Bromide (Searle)*

β-Diethylmethylaminoethyl 9-xanthenecarboxylate bromide

Actions and Uses.—Methantheline bromide, a parasympatholytic agent, produces the peripheral action of anticholinergic drugs such as atropine and the ganglionic blocking action of drugs such as tetraethylammonium chloride. Tolerated amounts of methantheline bromide exert side effects typical of atropine-like drugs, but cause less tachycardia, and also cause less postural hypotension than does tetraethylammonium chloride. Toxic doses produce a curare-like action at the somatic neuromuscular junction.

Clinical studies indicate that the drug effectively inhibits motility of the gastro-intestinal and genito-urinary tracts and, to a variable degree, diminishes the volume of perspiration and salivary, gastric, and pancreatic secretions. It also decreases mucoprotein secretion. Like atropine, it produces mydriasis and cycloplegia when applied locally to the eye or administered systemically, but until more clinical evidence becomes available, its local use for this purpose is not recommended. The value of the drug for preventing abnormal cardiac reflexes through the vagus during thoracic surgery, or as an agent for routine preoperative medication in place of atropine, requires further investigation before final conclusions can be reached.

Methantheline bromide is indicated for clinical use whenever anticholinergic spasmolytic action is desired, provided it is not contraindicated because of its atropine-like characteristics or because of a patient's intolerance to the unavoidable side effects of such therapy. It is useful as an adjunct in the management of peptic ulcer, chronic hypertrophic gastritis, certain less specific forms of gastritis, pylorospasm, hyperemesis gravidarum, biliary dyskinesia, acute and chronic pancreatitis, hypermotility of the small intestine not associated with organic change, ileostomies, spastic colon (mucous colitis, irritable bowel), diverticulitis, ureteral and urinary bladder spasm, hyperhidrosis or control of normal sweating which aggravates certain dermatoses, and control of salivation.

Methantheline bromide produces some degree of cycloplegia and mydriasis in therapeutic doses and therefore should not be administered to patients with glaucoma. It sometimes decreases the ability to read fine print. Xerostomia (dryness of the mouth) is a common, sometimes transient, side effect. Urinary retention of varying degrees may occur in elderly male patients with prostatic hypertrophy, and some patients may have difficulty emptying the rectum. Patients with edematous duodenal ulceration may experience nausea and vomiting during initial administration of the drug. These patients should take only liquids during the institution of drug therapy. All patients should be advised of the possible occurrence of side effects. Overdosage sufficient to produce a curare-like action may be counteracted by prompt subcutaneous injection of 2 mg. of neostigmine methylsulfate.

Dosage.—Methantheline bromide is administered orally or parenterally by either the intramuscular or intravenous route. Parenteral administration is not advised for patients able to take the drug orally. The average initial dose for adults, oral or parenteral, is 50 mg. For patients with considerable intolerance, 25 mg. may be employed. In the management of peptic ulcer, a beginning schedule of 50 mg. three times daily before meals, and 100 to 150 mg. on retiring is suggested. However, the usual effective dose is 100 mg. four times daily, although some patients may require more or less than this amount. The dosage may be increased to tolerance, using dryness of the mouth as a guide, and adjusted to meet the individual response of patients. Maintenance dosage in peptic ulcer is usually considered to be about one-half the therapeutic level. In the management of other hypermotile or hypersecretory states, the dosage should be adjusted to the smallest amount which will relieve the symptoms. When spastic conditions are secondary to inflammatory or other organic lesions, therapy directed toward the cause should be employed whenever possible.

G. D. SEARLE & CO.
Powder Banthine Bromide: 2 cc. ampuls. 50 mg.
Tablets Banthine Bromide: 50 mg.

XUM

ther rare for patients with disseminated lupus erythematosus to die in renal failure, and this patient certainly approached it, with her marked diminution in kidney function. Also, hypertension in patients with disseminated lupus is a very rare complication, even terminally, with the fair degree of renal damage that such patients develop.

Another in this group of closely related collagen disease is polyarteritis nodosa. This could account for many of the abnormalities just as well as lupus erythematosus can. However, there are some important differences. In polyarteritis there is commonly a leukocytosis rather than a leukopenia. I am not familiar with any long-standing rashes of this distribution that occur in polyarteritis. However, it could better account for the renal failure that led to the terminal phase of the patient's illness. Multiple pulmonary infarcts, a common occurrence in polyarteritis, could have caused the hemoptysis. I should like to interject that I have seen several cases in the last two years with lesions in the lung parenchyma very similar to the Aschoff nodules that one sees in rheumatic fever – and yet they occur in people with rather typical rheumatoid arthritis! The pathologists found the lesions to be somewhat atypical Aschoff nodules, and they were not at all happy about making a diagnosis of rheumatic fever. Both these patients developed marked pulmonary hypertension and increasing respiratory distress. Whether something of that sort had developed in this patient I do not know. I think it would possibly be better to explain the pulmonary symptoms on the basis of repeated pulmonary infarctions.

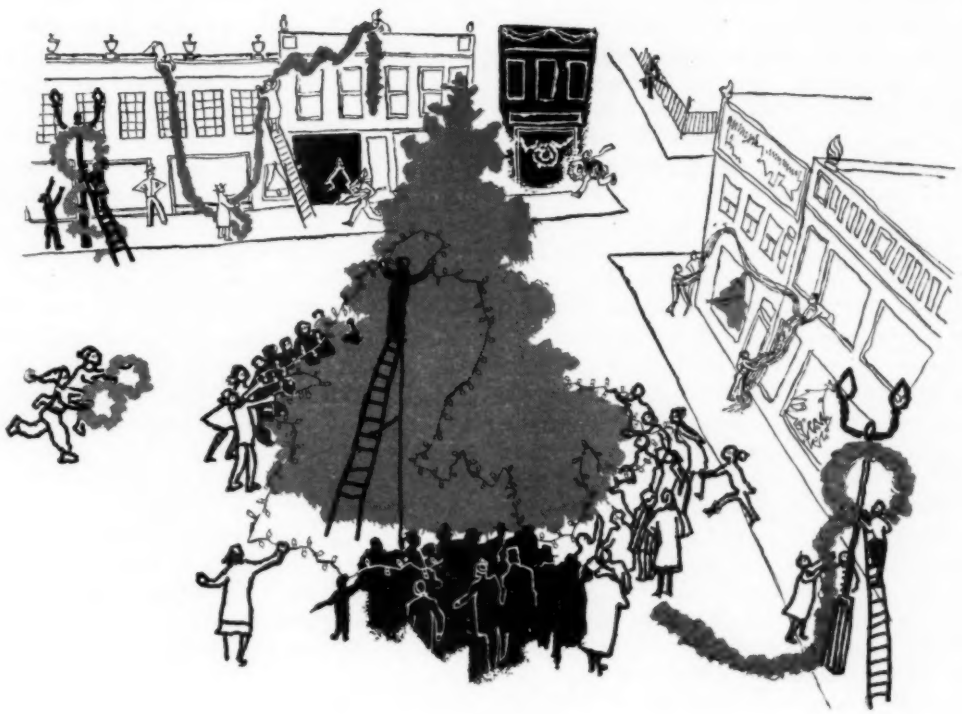
There is a fundamental hotly debated question whether the collagen or connective tissue diseases are related. One is impressed by seeing two patients who present essentially identical clinical pictures in adjacent beds in the hospital of whom one demonstrates the lupus erythematosus cells and the other does not. One patient's condition is called rheumatoid arthritis on the one hand and the usual case of the laboratory findings, is considered disseminated lupus. The average case of rheumatoid arthritis on the one hand and the usual case of lupus erythematosus on the other can be differentiated quite readily, but there is a twilight zone where cases of the two diseases become more and more similar. Whether they actually merge in the center is something I cannot answer. I have seen a case of dermatomyositis in which the symptoms of dermatomyositis disappear toward the end and in which the outstanding autopsy findings were actually those of polyarteritis nodosa.

In summary, I think the patient had changes that I would consider those of rheumatoid arthritis. I think she also had disseminated lupus and I would not be at all surprised to find in the kidneys, in addition to the wire-loop changes that have been described as characteristic of lupus, some larger-vessel changes that would be consistent with polyarteritis. I began by trying to explain this on the basis of one disease. I am ending up with a mixed grill. I probably shall regret it, but it seems to me that these diseases merge with one another so frequently that it is extremely difficult to draw the line – certainly clinically and sometimes even pathologically.

Dr. MARIAN W. ROGERS: We had much the same difficulty as Dr. Stillman did in deciding where in the group of connective-tissue diseases to place this patient's disease. Lupus erythematosus is unusual in a woman over sixty years of age, although it does occur. However, we made a diagnosis of disseminated lupus erythematosus, the rash was not typical but was not entirely atypical, and the renal involvement, we thought was part of the general disease. We raised the question of some other type of renal disease's being present also because we believed the degree of renal involvement was unusual for lupus erythematosus. It has been our practice to assume that the joints of this type were due to rheumatoid arthritis, but more and more we hesitate to say that disseminated lupus erythematosus cannot cause such changes. I do not know the answer. I would say that this patient had chronic joint disease that was in no way distinguished from rheumatoid arthritis but may have been part of lupus erythematosus.

No one expected this patient to do well on cortisone; the renal disease was her main difficulty, and we have no evidence that cortisone improves renal disease. However, we believed that this was one more case to prove that cortisone does not improve renal disease. She went downhill on treatment. There was one other reason for giving cortisone. There was some question whether the eye signs were

XUM



They'd decorate it all in an hour...

all the patients who represent the 44 uses for short-acting

NEMBUTAL®

For Insomnia or Sedative Effect
try the 50-mg. (¾-gr.) Nembutal Sodium capsule.
For Brief and Profound Hypnosis
try the 0.1 Gm. (1½-gr.) Nembutal Sodium capsule

1-2158A

● For every patient's need . . . in many dosage forms . . . *in more than 44 clinical conditions,* short-acting NEMBUTAL offers these advantages:

1. *Short-acting* NEMBUTAL (*Pentobarbital, Abbott*) *can produce any desired degree of cerebral depression—from mild sedation to deep hypnosis.*
2. *The dosage required is small—only about one-half that of many other barbiturates.*
3. *Hence, there's less drug to be inactivated, shorter duration of effect, wide margin of safety and little tendency toward morning-after hangover.*
4. *In equal oral doses, no other barbiturate combines quicker, briefer, more profound effect.*

Won't *you* remember—and compare—these advantages the next time, and every time, you write a barbiturate prescription?

Abbott

WHEN WRITING ADVERTISERS PLEASE MENTION THIS JOURNAL

due to lupus erythematosus or to renal disease. If they were due to lupus, we believed they might improve on cortisone.

I should like to hear Dr. Cogan's opinion concerning whether the eye signs were due to lupus erythematosus or to renal disease.

Dr. DAVID G. COGAN: The eyes showed diffuse hemorrhages throughout the fundi that were quite nonspecific. The distribution of the changes was that which one sees in hypertensive retinopathy, but one never sees the quantity of hemorrhages and exudates that she had without more marked changes in the vessels when it is due to hypertension alone. Despite what the record says, it was my opinion that the vessels showed very little change. They were certainly not proportionate to the extensive retinopathy. I think the change was not secondary to the renal disease.

Dr. ROPES: I think it was the impression that there was some improvement in the eye condition, due to cortisone.

Dr. COGAN: I did not see the patient after she was treated with cortisone.

Dr. ROPES: It was questionable, but the ophthalmologist who saw her believed that there was some improvement and that this gave further suggestion that the eye changes were associated with disseminated lupus erythematosus rather than with renal disease.

CLINICAL DIAGNOSIS: Lupus erythematosus disseminatus

Dr. STILLMAN'S DIAGNOSIS: Rheumatoid arthritis; Lupus erythematosus disseminatus; , Polyarteritis nodosa of kidney

ANATOMICAL DIAGNOSIS: (Lupus erythematosus disseminatus); Polyarteritis nodosa; Rheumatoid arthritis; Myocarditis with Aschoff nodules; Glomerulitis, focal, acute and chronic; Endocarditis of mitral valve, acute and chronic; Pericarditis, fibrinous and fibrous, with extensive edema.

PATHOLOGICAL DISCUSSION

Dr. TRACY B. MALLORY: The diseases of this group are quite as hard to distinguish anatomically as they are clinically – perhaps harder – and very often clinical and anatomic evidence do not agree very well in a matter of classification. Some of you may remember a case of apparently clinically typical disseminated lupus erythematosus discussed by Dr. Soma Weiss some years ago in this amphitheater in which the autopsy showed a widely disseminated polyarteritis nodosa. That was the major anatomic finding in the case under discussion. Grossly, the most impressive lesions were a severe pericarditis with marked thickening of the pericardial tissue, as well as a considerable accumulation of fluid, some degree of endocarditis of the mitral valve and very peculiar kidneys. They were of approximately normal size, or only very slightly enlarged. The cortex was described as being of a greenish-gray color. There were no areas of infarction such as one would expect if the renal lesion was secondary to the vascular one. Microscopical preparations showed the presence of widespread vascular lesions in virtually every organ of the body. In the kidneys there were occasional examples of the so-called wire-loops, but others were obscured by severe diffuse glomerulitis with fibrinoid necrosis of the tufts, an appearance that has been described in polyarteritis nodosa by Davson, Ball and Platt. The mitral vegetations showed fibrinoid necrosis, and scattered through the myocardium were numerous foci quite typical of Aschoff bodies.

Dr. WILLIAM CLARK: If you finally classify the patient as having had polyarteritis nodosa, I would say what Soma Weiss said—that this was actually lupus erythematosus with widespread vascular lesions similar to periarteritis nodosa.

Dr. MALLORY: By now there have been a great many cases, here and elsewhere, of clinically typical lupus erythematosus that have shown widespread polyarteritis nodosa at autopsy.

Dr. STILLMAN: Isn't that true also of dermatomyositis?

Dr. MALLORY: I believe it to be true. It also can be true of rheumatic fever. The existence of arteritis lesions does not rule out any other diagnosis.

Dr. ROPES: And the relationship of the lesions to the clinical picture remains unknown!

Dr. WILLIAM CLARK: And the finding of Aschoff bodies does not make it necessary to make a diagnosis of rheumatic fever!

* * *

ARIZONA MEDICINE JOURNAL, IS INTERCHANGING JOURNALS WITH 54 FOREIGN MEDICAL LIBRARIES

Your Official Professional Group Accident and Sickness Plan

Approved and recommended by Council Of

THE ARIZONA MEDICAL ASSOCIATION, INC.

Provides Maximum Protection at Minimum Cost
World Wide Coverage

IT PAYS YOU:

$300 a Month for Total Disability by Accident up to 5 years
$150 a Month for Partial Disability by Accident up to 6 months
$300 a Month for Sickness up to 2 years

$2,500 Accidental Death

$10,000 Dismemberment and Loss of Sight

$7.00 a Day for Hospital Plus **$25** for Miscellaneous Expenses
$5.00 a Day for Graduate Nurse, at home

LOW SEMI-ANNUAL PREMIUMS

Through Age 49—$49.80 Ages 50 through 59—$56.60 Ages 60 to 65—$70.05

NO AGE LIMIT FOR RENEWAL

Policy Cannot Be Terminated Except For

1. Non-payment of premium
2. Retirement from practice
3. Loss of membership in Association
4. Termination of master policy

For additional information and official application contact

SIMIS INSURANCE SERVICE AGENCY

State Representatives

NATIONAL CASUALTY COMPANY

DWIGHT McCLURE GEORGE B. LITTLEFIELD W. J. WINGAR
Telephone ALpine 3-1185 407 Luhrs Building, Phoenix

PAUL H. JONES INSURANCE AGENCY

Pima County Representative

617 N. Stone Avenue, Tucson, Arizona Telephone: Tucson 2-2803

Our members are dairymen whose business is supplying good milk for

WEBSTER'S

milk and milk products.

We are aware of the importance of good milk to good health and of our obligation to supply a product which will merit your confidence.

ARIZONA MILK PRODUCERS

422 Heard Building Phone ALpine 3-0893

METAL OFFICE FURNITURE
G. F. STEEL DESKS
ALUMINUM CHAIRS
CARDINEER ROTARY & VICTOR
VISIBLE FILES

Heinze Bowen & Harrington, Inc.

228 West Washington St.
Phone ALpine 4-4179
PHOENIX ARIZONA

WHY BUY

WHEN WE SUPPLY

Everything in linens and uniforms for the physician and his staff

CITY LINEN SUPPLY INC.

333 N. 7th Ave. — Phoenix, Arizona

ALpine 3-5175

The PRESIDENT'S Page

MERRY CHRISTMAS

THE OFFICERS OF ARIZONA MEDICAL ASSOCIATION, OUR EXECUTIVE SECRETARY BOB CARPENTER, AND THE EDITORIAL STAFF AND THE PUBLISHER OF ARIZONA MEDICINE JOIN ME IN EXTENDING THE SEASON'S GREETINGS TO ALL OUR MEMBERSHIP, TO OUR MEDICAL AUXILIARY, AND TO ALL OUR FRIENDS WHO MAKE ARIZONA MEDICINE A FINE JOURNAL.

HAPPY NEW YEAR

Edward M. Hayden

President

Editorial

ARIZONA MEDICINE
Journal of
ARIZONA MEDICAL ASSOCIATION, INC.
VOL. 10 DECEMBER, 1953 NO. 12

EDITORIAL BOARD
R. Lee Foster, M.D. ..... Editor-in-Chief, Phoenix
Harold W. Kohl, M.D. ..... Assistant Editor, Tucson
ASSOCIATE EDITORS
William H. Cleveland, M.D. ..... Phoenix
Howard D. Cogswell, M.D. ..... Tucson
Louis G. Jekel, M.D. ..... Phoenix
Frank J. Milloy, M.D. ..... Phoenix
William H. Oatway, Jr., M.D. ..... Tucson
Leslie B. Smith, M.D. ..... Phoenix
Arie C. Van Ravenswaay, M.D. ..... Tucson
W. Warner Watkins, M.D. ..... Phoenix
COMMITTEE ON PUBLISHING
R. Lee Foster, M.D., Chairman ..... Phoenix
Carroll C. Creighton, M.D. ..... Flagstaff
Donald E. Nelson, M.D. ..... Safford
Darwin W. Neubauer, M.D. ..... Tucson
Robert Carpenter, Executive Secretary,
Arizona Medical Association, Inc.
ADVERTISING AND SUBSCRIPTION OFFICERS
J. N. McMEEKIN, Publisher and Business Manager,
424 Heard Building, Phoenix, Arizona
Eastern Representative
A. J. JACKSON, Director
State Journal Advertising Bureau
535 N. Dearborn St., Chicago 10, Illinois

CONTRIBUTORS

The Editor sincerely solicits contributions of scientific articles for publication in ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Certain general rules must be followed, however, and the Editor therefore respectfully submits the following suggestions to authors and contributors:

1. Follow the general rules of good English, especially with regard to construction, diction, spelling, and punctuation.
2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. (See MEDICAL WRITING by Morris Fishbein.)
3. Be brief, even while being thorough and complete. Avoid unnecessary words. Try to limit the article to 1500 words.
4. Read and re-read the manuscript several times to correct it, especially for spelling and punctuation.
5. Submit manuscript typewritten and double-spaced.
6. Articles for publication should have been read before a controversial body, e.g., a hospital staff meeting, or a county medical society meeting.

The Editor is always ready, willing, and happy to help in any way possible.

HOW MUCH CAN ONE BELIEVE?

Every now and then (and pretty often, too) a physician must wonder how much he can believe about new drugs, new methods, new opinions. How much can he, should he, dare he believe?

In the 'olden days' (about 1900 A.D.) one could wait a few years before deciding. One would also have to wait almost that long before anything amazingly new challenged belief.

In these days, however, we have medical miracles popping up as frequently as new moons. Is it a real moon or is it a 'prop'? We must decide if we are to be modern, if we are to be true to our patients and colleagues. There must be some few criteria or a routine which will give us help.

The sources from which we get our 'scientific' news should be carefully considered and evaluated.

These include the popular magazines, newspapers, drug house publications, trade journal, scientific magazines and medical journals. Without being specific about any of these, it can be said that they do vary in the scientific accuracy of their reporting. In part this may be an unavoidable consequence of the present day demand for rapid dissemination of news. A sensational or newsworthy development often cannot wait for the long laborious time-consuming task of scientific verification or it is no longer news. Unfortunately individual bias or certain vested interests may influence some publications. Other possible influences could be cited.

It would seem as though we must keep our eyes open, sharpen our native wits, maintain a certain healthy skepticism, use all of the best sources for our estimates, and establish our own criteria. As a currently fashionable detective of the air says "all we want are the facts, ma'am", and we will then solve the case. Therefore:

1. Consider the source of the report.
2. Think back on the history of the subject or drug. Is it logical?
3. Ask an authority for an opinion. Use a local oracle, a solid teacher, 'Minor Notes and Queries', an editor, etc.
4. Remember that flaws or toxicity are almost inevitable in any new method or drug.
5. Decide on the need for the item. Is it urgent enough to take a chance?
6. Consider the patient.
7. Remember the laws and conventions which cover the use of new procedures. Are you prepared to proceed with research-type observations?
8. Better wait, unless you have the facilities and faculties. Better be a conservative than to play the lead in 'Gullible's Travels' or 'Dr. Alice in Wonderland'.

W.H.O. Jr.

XUM

Arizona Pharmaceutical Page

WITH OUR BOARD OF PHARMACY INSPECTOR

Yesterday we went into Mr. Blank's pharmacy and asked for 2 oz. Elixer of Phenobarbital. Mr. Blank's pharmacist informed us we must have a prescription in order to purchase this medication. He told us he could not legally sell it otherwise and explained that as the particular preparation we asked for was considered of a dangerous nature by the Federal Food and Drug Administration, and subject to much abuse, we should contact our physician. When he learned we were representing the Board of Pharmacy and that he could have been subject to a fine and the subsequent disgrace of being a law violater had he made the sale, he told us he always turned down requests for dangerous drugs and referred applicants to their physicians. We then collected from Mr. Blank sealed samples for analysis relative their purity and efficacy.

We checked a list of drugs which would spoil if not kept in a cool place and made certain those medicines were under refrigeration. At the time we checked the expiration dates on the packages which tend to lose their potency.

We checked the prescription scales and weights and confiscated two that were not quite up to par. We looked over his graduates, mortar and pestles, funnels, stirring rods, pill tile, homogonizer, suppository mold and other items of equipment to ascertain their condition and cleanliness. We looked over his library to ascertain if he had the required volumes of formulae and reference books.

Then, we checked the cleanliness of the prescription room; its lighting, the storage room; the toilet facilities; the general condition of the merchandise; the condition of the sink and availability of sterilization equipment; how he stored his poisons and narcotic drugs. We looked over the prescription files to ascertain if known users of narcotic or hypnotic drugs were listed on it and checked the myriad licenses and reports required to be kept by every pharmacy.

All of this was checked on the regular inspection chart of the board of pharmacy and percentage points were assigned. Mr. Blank received 91% on the inspection – a top grade, meaning that he has the necessary equipment, stock, facilities, information and ability to fill the prescription you have so carefully written for your sick patient. We spent an hour and a half with this pharmacy and can recommend it to each of you as a proper place to use for dispensing the prescriptions you write. These check sheets are posted in every pharmacy in Arizona. We consider the operation of our pharmacies as health stations and you may check these reports in any of them. The Board of Pharmacy recognizes the main reason for the existence of a pharmacy is to fill prescriptions and we are continually striving to have available for your use the finest pharmaceutical service obtainable.

The Board and every pharmacist in our state, would appreciate any suggestions leading to the betterment of our pharmaceutical service.

XUM

TOPICS OF *Current Medical* INTEREST

RX., DX., AND DRS.

By GUILLERMO OSLER, M.D.

A new Isoniazed-type drug with a low toxicity and very promising therapeutic effects is to be reported in the Stanford Medical Bulletin, and later in the American Review of Tuberculosis.

The drug is now called 'GATHALONE' and is D-GLUCURON ISONICOTINYL HYDRAZONE. It contains about 46 per cent isoniazid, and is made in 200 mg. tablets. It was synthesized and given its first testing by the Pharmacy Department of the University of California.

The group since then has completed experiments in tuberculous mice, gotten past the first cautious use in humans, and has now used it for 9 months in two Bay area sanatoria. It compares with other current drugs in animals, and in humans it has several advantages which are notable.

There is almost no toxicity until huge doses are used. The dose now used is 1,800 mg. per day, plus a vitamin B. Complex preparation to prevent neurotoxicity. After a month or two of therapy almost all sputums are converted to negative in all sorts of cases. X-rays routinely show some degree of healing, often marked. in 3 months.

Sensitivity studies have not been possible because of sputum conversion, but tests on isoniazid-resistant strains show no cross resistance. The patients gain weight and improve as they do with INH. There have not been postresection bacterial studies on the lesions, nor any data on the fate after discontinuance of therapy.

The effect of the drug may be due to the high blood levels, which are 14 to 16 mg. % or 5 times higher than isonaizid.

The Mayo Clinic is now using 'Gathalone', and it is to be given to other large hospitals in California. The V.A. is to do a pilot study. Material for experimental series can be obtained from the Barnes-Hind Co. in San Francisco. Needless to say, if this work can be duplicated elsewhere, a most valuable drug will be added to those now at hand. No confirmation yet.

Are you interested in DISEASES OF THE CHEST? Do you like to travel to far places? Are you inirigued by the French and British? Are you free for a week NEXT MAY? . . . . A perfect 'combo' of 'yes' answers could lead you to the AMERICAN ASSOCIATION OF THORACIC SURGERY MEETINGS in Montreal, with the somewhat diluted British & French, on the days of May 3rd, 4th, and 5th . . . The headquarters is the Mt. Royal Hotel (now a Sheraton), and the Canadians have been pretty good hosts in times past . . . If you have a paper in mind, get the data on submission of abstracts, etc., from each issue of the Journal of Thoracic Surgery . . . The king-size, aggressive, politic, cultured secretary is still Dr. Paul (Buck) Samson of San Francisco.

Dr. Richard Kern of Philadelphia asks a forensic question about **allergy** in CALIFORNIA MEDICINE and then answers it. . . . About one in seven (15%) of your patients will have a major allergic episode some time in his lifetime. How can you tell which ones are allergic? . . . Very simple, he says. **Ask them!** They usually know.

Every now and then the opportunity occurs to refer to a past paragraph from this present column. In the present case it isn't to gloat but to add a follow-up. . . . The item of 2 years ago referred to the use of CABBAGE JUICE in treatment of PEPTIC ULCER. Dr. Garnett Cheney of Stanford was responsible. . . . He now reports to the National Gastroenterological Association (hereinafter referred to as the Nat'l. G-I Ass'n.) that a mysterious "Vitamin U" is the essence of the juice from cabbages and certain other fresh vegetables. . . . The material has been concentrated, can be given in capsules, and he expects 9 out of 10 cases to be 'healed. No analysis or synthesis yet, nor any commercial supply.

If you are an obstetrician, or a GP who does obstetrics, and are looking for new frontiers, here's a possibility. . . . TIME Magazine reports that the INCIDENCE OF TWINS is steadily declining. In 1939 one of every 86 births was twin; in 1949 one of every 97; since then, even less . . . The frontier? No reason is known for the decline. . . . Dr. Alan Guttmacher of New York is an identical twin himself. In spite of his special interest he has no specific lead. He thinks it may be an environmental or biologic factor affecting mothers. . . . You can start figuring from the days when tight corsets would have been blamed, and work up to smoking and smog. Good luck!

The GOFMAN TEST has received some asparagus-type remarks (here too), but chiefly

XUM

because of its limited present practical use and because of its considerable cost. . . . Actually it is a small piece in the cholesterol-arteriosclerosis jig-saw puzzle, and Dr. John Gofman is quite a research guy. . . . One can predict that someday we will know more about the "large' cholesterol molecules; that a diet-plus-drug routine will become available; and that we cannot only prevent but even treat some types of arterial disease. . . . (This sounds almost like a politician promising a better world.)

Have you seen a CASE OF LEPROSY lately? Or have you learned to call it Hansen's Disease? . . . You COULD see one, since statistics in nearby California show 524 cases reported since 1920. Most of the cases were immigrants, but it was figured that 27 were contracted within the state. Most lepers contract their disease in childhood, and it takes several years to incubate. . . . The sulfone drugs are very valuable, and can be used as a basis of comparison for newer drugs. The non-infectious tuberculoid leprosy may remain at home during therapy, but the dangerous infectious lepromatous cases are safer in a leprosarium until the disease progress is halted. . . . Nearly two-thirds of the lepromatous cases may return to public life after 3 or 5 years of therapy.

'MEDICINE ILLUSTRATED' is a refreshing monthly English journal. It is in its seventh volume, and has everything except color reproductions. . . . The major theme of the journal is its illustrations, and the charts, photography, and drawings are not only well done but break up the text very nicely. The editors had already tended to fracture the old British habit of endless paragraphs and rare sub-titles. . . . Glossy stock, an illustrated cover, three shillings and six-pence per copy, 40 shilling per year in the Empire, $7 in U. S. and Canada. . . . Carry on!

The most formidable and impossible test of a persons diagnostic ability would be to see whether he or she could recognize METASTASIS OF NEOPLASMS to the heart and adrenals. . . . Data from the Walter Reed Hospital on 400 cases of carcinoma, studied clinically and at autopsy, show that the course is indeed sporty. NONE of the 81 instances of adrenal metastasis was picked up ante-mortem. . . . A couple of symptoms and signs can suggest cardiac involvement. The origin of the lesion (lung in 35 cases), and an ACTH test for adrenal insufficiency may give a lead to adrenal lesions.

It is interesting to play a game with 'CANCER-CAUSES' . . . Do the new pieces of evidence lend strength to infection as a cause? Chemical or other types of irritation? Heredity? Endocrine factors? . . . The obvious effect of hormones on cancer of the prostrate and breast makes one keep an eye on the glands. But how about smoking and bronchial lesions (a relationship yet to be thoroughly demonstrated)? . . . It keeps one alert and, unlike strictly spectator sports, we are all potential participants.

Here's a merry-go-round type of logic which just might end up with a good practical result—ISONIAZID has recently been reported to cause a PERIPHERAL NEURITIS. Some of its newer analogues are given in larger doses, and are even more prone to cause nerve disorders. People with TB may also have diabetes. People with diabetes often have neuritis and neuralgias. Vitamin B complex has been used to treat neuritis, often with success. . . . Why not use a poly-B preparation as a preventive when the INH drugs are used, especially in diabetics? Says the echo "Why not?"

ISONIAZID is the current joy of experimentalists. A few cases of almost everything are said to respond to the drug. . . . This isn't very logical since the results in vitro were narrowed down to acid-fast bacilli. It would be worth while to try it when the situation is an impasse, and possibly logical (or logically possible), but avoid fooling self and patient. . . . Chronic discoid LUPUS erythematosis is said to be helped. SARCOIDOSIS has been "clinically improved". Results in ACTINOMYCOSIS are "encouraging" . . . . We'll give these three a 50 per cent chance, and probably should divide that figure by two.

Sir William Osler warned the medical profession, in a talk at Yale in 1913, of the results which can follow TOO MUCH TENSION AND PRESSURE. He advised how they can be avoided in that lecture, 'A Way of Life'. . . . He urged self-management. One must be conscious of time. One cannot afford not to cultivate the mind. One must live day by day. Keep in contact for a few minutes every day with some part of the world's best literature. Slow your step. Throw off yesterday and tomorrow when you sleep. See what lies clearly at hand. . . . (And, according to most present standards, be a vegetable!)

Dr. Robert Browning of Columbus, Ohio, points out a TB therapeutic fault by using a well-turned phrase. It's a serious fault, too, tho it is hardly fair to criticize a notably effective treatment. . . . Browning says that "TIME LAG" in the use of anti-TB drugs is the fault. It actually is a fault of application, due to the changing methods of use as more information becomes available. . . . Reports do not get out to the physician fast enough, and he does not quickly use them. A failure to correlate usage with rest, pneumo, and surgical therapy may cost the patient dearly as the months and years pass. . . . Watch the Time Lag, gents!

XUM

NOT FOR PROFIT

THE HOSPITAL BENEFIT Bulletin

Special Published Bi-Monthly by the Hospital Benefit Association, First Street at Willetta, Phoenix December, 1953

Question QUIZ
Do you know the answers?

Q. Under the Surgical Plan does the Association pay surgical fees for injuries resulting from an accident, even though the patient is not hospitalized?

A. Yes. In case of an accident to an HBA member, the doctor may be paid for services given at the scene of the accident, in the home or at the doctor's office, within 24 hours of the accident.

Q. Can doctors help expedite processing of claims?

A. Yes. In fact, the Association wants to pay claims quickly. It will do so if doctors will fill out and return promptly the claim form sen them by the Association.

Q. What per cent of claims submitted to the Hospital Benefit Association require long-claim forms and hospital reports?

A. Approximately 3 per cent require further information to establish date of onset of the illness (only illnesses that actually begin or are diagnosed 30 days after effective date of membership are eligible. Accidents are covered from the first day of membership.

Q. Will the Surgical Plan pay for an X-ray at the laboratory or the doctor's office?

A. Yes — if it is needed because of an accident, and is taken within 24 hours after the accident.

New Television Show Adaptation of "Doctor"

The Hospital Benefit Association's new TV Show, "The Visitor," is an adaotation of the famous series entitled "The Doctor." In these half-hour shows, "The Visitor" takes the TV audience into the private lives of people caught in the web of dramatic circumstance. This new TV show can be seen on Channel 12 over (KTYL-TV) every Thursday, from 7:30 to 8:00 P.M.

Hospital Benefit Association Appreciates Physicians' Cooperation

The Hospital Benefit Association has been especially pleased with the way physicians in Arizona have cooperated. Physicians realize that the Association always tries to be fair and equitable with members, and as a result, have been extremely honest in their statements about the history and symptoms of the patient. The Association, of course, appreciates this cooperation from physicians and considers it a verification of the organization's confidence in the profession.

During the past year, doctors, nurses and staff members of every Arizona hospital have given the Hospital Benefit Association their whole-hearted cooperation. At this holiday season, we of the Association wish to express our heart-felt appreciation and to wish all of you and your families a Merry Christmas and a Happy New Year.

Association Cooperates With Physicians

The Hospital Benefit Association, in turn, cooperates fully with physicians. To conserve their time — and save them trouble — the Association requires oinly a short claim form in the vast majority of cases requiring hospitalization of members. In most cases, the Association authorizes payment to the doctor on the basis of this short bill form submitted by the doctor.

Claim Forms Sometimes Required

Occasionally, however, the Hospital Benefit Association requires a long claim form. It is required only when the Association needs additional information in order to come to a fair and equitable decision on the coverage to which a member is entitled. Such a situation might arise with a new member or in the case of a membership issued with the written understanding that a pre-existing condition would not be covered. Upon occasion, the Association receives a llled-in claim form which the physician does not wish the patient to see. In that case, the Association refers only to "hospital records," rather than to the physician's statements, when explaining to a member why he did not receive benevts.

The Association cooperates with physicians in every way possible and always welcomes any suggestion for improving its services.

XUM

A long-time columnist for the Wisconsin Medical Journal, and professor of pharmacy at U. of W. (remember Tryparsamide?), brings out with brutal clarity the frequency of SENSITIZATION TO ANTIBIOTICS. . . . He thinks the incidence will increase, since more and more people are being given the drugs without even a hat being dropped. The total number eligible for sensitivity reactions keeps piling up. . . . He wants to be clear and brutal about it, since the results can be so tragic — not just skin rashes, but anphylaxis and death. . . . The death is just as final whether the former usage was needed or was unjustified, as it so often is. . . And have you got it clearly in mind what you do for acute serious allergy reaction? Should have, and keep the tools handy.

SECOND ANNUAL CANCER SEMINAR

The second annual cancer seminar jointly sponsored by the Arizona division of The American Cancer Society and The Arizona Medical Association will be held at Paradise Inn, Phoenix, Jan. 14, 15, 16, 1954.

This series was started by Dr. Edward H. Bregman, executive chairman of the society and Mrs. Robert H. May, president, as a means of disseminating knowledge of the newer advances in the diagnosis and treatment of carcinoma to the physicians of Arizona and of the Rocky Mountain area.

Last year, there were 225 registrants. Colorado, Wyoming, Utah, California and Nevada were represented.

A program committee composed of Dr. Bregman, Dr. Thomas Bate and Dr. James Barger as co-chairman have arranged a stimulating program for this year's seminar.

ARIZONA DIVISION, AMERICAN CANCER SOCIETY PROGRAM 1954 CANCER SEMINAR

January 14, 1954

9:30 A.M. Recent Advances in Cancer Therapy
(Chemotherapy, Radiation and Radioisotopes)

Panel Members—Paul C. Aebersold, Ph. D., Atomic Energy Commission; Michael DeBakey, M.D., Professor of Surgery, Baylor University; L. H. Garland, M.D., Professor of Radiology, Stanford University; Joe Vincent Meigs, M. D. Professor of Gynecology, Harvard; Orvar Swenson, M.D., Associate Professor of Surgery, Tufts Medical School.

Moderator—Edward Hayden, M.D., Radiologist, Tucson.

11:00 A.M., Neoplasms of the Central Nervous System

Panel Members—Percival Bailey, M.D., Professor of Neuro-Surgery, University of Illinois; E. S. Gurdjian, M.D., Professor of Neuro-Surgery, Wayne University; Eugene Pendergrass, M.D., Professor of Radiology, University of Pennsylvania.

Moderator—John R. Green, M.D., Neuro-Surgeon, Phoenix.

2:00 P.M., Carcinoma of the Cervix

Panel Members—O. A. Brines, M.D., Professor of Pathology, Wayne University; Joe Vincent Meigs, M.D.; L. H. Garland, M.D.

Moderator—Preston T. Brown, M.D., Gynecologist, Phoenix.

3:30 P.M., Carcinoma of the Breast

Panel Members—Michael DeBakey, M.D.; O. A. Brines, M.D.; Anthony Curreri, M.D., Associate Professor of Surgery, University of Wisconsin; Eugene P. Pendergrass, M.D.

Moderator: Douglas Gain, M.D., Radiologist, Phoenix.

January 15, 1954

9:30 A.M., Exfoliative Cytology

Panel Members—L. H. Garland, M.D.; Joe Vincent Meigs, M.D.; David A. Wood, M.D. Professor of Pathology, Stanford.

Moderator—O. O. Williams, M.D., Pathologist, Phoenix.

10:00 A.M., Surgical Methods for Relief of Intractable Pain

Panel Members—Percival Bailey, M.D.; E. S. Gurdjian, M.D.; Eugene Pendergrass, M.D.:

Moderator—John A. Eisenbeiss, M.D., Neuro-Surgeon, Phoenix.

2:00 P.M., Carcinoma of the Lung

Panel Members—Michael DeBakey, M.D.; Anthony Curreri, M.D.; Eugene Pendergrass, M.D.; David A. Wood, M.D.

Moderator—D. W. Melick, M.D., Chest Surgeon, Phoenix.

3:30 P.M., Trends in Cancer Research

Panel Members—To be presented by Dr. Cameron.

Moderator—Charles S. Cameron, M.D., Medical and Scientific Director of American Cancer Society.

January 16, 1954

10:00 A.M., Leukemia and Lypmhomas

Panel Members—L. H. Garland, M.D.; Orvar Swenson, M. D.; David A. Wood, M.D.

Moderator—Ralph Fuller, M.D., Pathologist,

XUM

Doctor, would it be helpful to you in your practice to know that there is a food available at reasonable prices in the stores the year round having these attributes:

1. High public acceptance as to flavor and palatability—billions eaten annually.

2. One of the best of the "protective" foods with a well-rounded supply of vitamins and minerals.

3. Low sodium—very little fat—no cholesterol.

4. Sealed by nature in a dust-proof package.

5. One of the first solid foods fed babies.

6. Can be easily digested by old folks as well as infants.

7. Can be readily eaten out of hand, in milk shakes, on cereals, or in salads.

8. Can be baked, broiled or fried.

9. Can be used as an ingredient product in breads, pies, cakes and desserts.

10. Useful in bland and low-residue diets.

11. Mildly laxative.

12. May be used in the management of both diarrhea and constipation.

13. Can be used in reducing diets.

14. Can be used in high-calorie diets.

15. Useful in the dietary management of celiac disease.

16. Useful in the dietary management of idiopathic non-tropical sprue.

17. Useful in the management of diabetic diets.

18. Valuable in many allergy diets.

19. Belongs among foods useful in certain acute intestinal infections.

20. A protein sparer.

21. Favorably influences mineral retention.

22. Useful in the management of ulcer diets.

23. One of the easiest foods to eat or prepare.

FOR THE NAME OF THIS FOOD, PLEASE TURN THE PAGE

The answer is

B A N A N A S

If you would like

1. The authority for any of the statements made on the preceding page...
2. Additional information in connection with any of them...
3. The composition of the banana . . .
4. The nutritional story of the banana . . .
5. Information on various ways to prepare or serve bananas.

Please feel free to write to

Director, Chemical and Nutrition Research, United Fruit Company

PIER 3, NORTH RIVER, NEW YORK 6, N. Y.

Tucson.

11:30 A.M., Tumors of Childhood

Panel Members—O. A. Brines, M.D.; L. H. Garland, M.D.; Orvar Swenson, M.D.

Moderator—Hugh Thompson, M.D., Pediatrician, Tucson.

All sessions will be held at PARADISE INN. PHOENIX, ARIZONA

Delegates will be housed at Paradise Inn and other resort hotels of the area.

All of last year's registrants will receive programs and registration blanks. Attendance this year will be limited to 300. Any physician desirous of obtaining registration blanks can write to Mrs. Robert May, % The American Cancer Society, 1429 North First St., Phoenix, Arizona, or Dr. Edward H. Bregman % X-ray Department, Good Samaritan Hospital, Phoenix, Arizona. The registration fee is $5.00.

A CORRECTION

On page 409, November, 1953 issue of Arizona Medicine. Dr. O. J. Farness's article "Tuberculosis Problem in Arizona." Second paragraph line 7, the line reads as follows: "492 persons died of tuberculosis." That line should have read "402 persons died of tuberculosis."

IN MEMORIAL

Marshall E. Burgess, M. D.
August 26, 1879 – September 23, 1953
Past President of the
Gila County Medical Association
Member of the Fifty Year Club
Arizona Medical Association
Member of the Miami Chamber of Commerce
Miami B. P. O. E.
Miami Lions Club
Mayor of Miami, Arizona

Whereas God in his infinite wisdom, has chosen to take from us Marshall E. Burgess, of Miami, Arizona. Now we of the Gila County Medical Society of which he was an honored member comment as follows:

His was a kind and loving nature; his was a gracious and grateful attitude toward all mankind whether rich or poor; his was a character of high moral virtue and supreme unselfishness to others.

In the highest tradition of the only profession which speaks the only Universal Language—the Profession of Medicine—he dedicated his life and worthiness to its ideals.

Therefore we deplore his untimely death.
We extend to his bereaved and beloved wife and all his relatives our sincerest sympathies.

Gila County Medical Society

The Professional Board

ARIZONA'S MENTAL HEALTH PROGRAM

Ernest A. Born, M.D.

Mental health and its problems in Arizona first received attention as a permanent field of endeavor for a particular body of the Arizona Medical Association with the appointment of the Sub-Committee on Mental Diseases by the Professional Board at its first meeting in 1947. Prior to this time, action on mental health problems was handled, as occasion arose, by Council and the House of Delegates. The first year of activity, the Sub-Committee on Mental Diseases was concerned principally with the Arizona State Hospital; a center of political controversy and confusion. Great progress could have been made had only a small of the attention, given to political bickering and bad pubilicity, been directed towards the care of the mentally ill and improvement of the institution.

Dr. John A. Larsen was appointed as superintendent to the institution in March, 1947, and incurred the displeasure of the politicos and controlling body by instituting a plan of care which was to substitute active treatment for domicilary care which had been the rule of the hospital for many years. His aim was to reduce the overcrowding by returning to civil life all possible cases, by active treatment measures, and segregating all inmates into categories according to their prognosis as to recovery, instituting active treatment on all those likely to be cured. Dr. Larsen's objective was to secure for the institution, the approval of the American Psychiatric Association as well as the American College of Surgeons. His methods, if not his intent, were not condoned by his superiors and were considered too radical and Dr. Larsen saw fit to seek greener pastures; however, his turbulent tenure of office did a great deal for our State Hospital. Succeeding superintendents have been accountable to a non-political board, and were left a foundation as well as a goal to work toward.

The principal fault with our State Hospital has been, and still is, one of over-crowding. Present capacity of the hospital is less than 1,000 beds and the patient load usually exceeds 1,600, and it ranks as the most crowded hospital in the United States for the treatment of the mentally ill; carrying an over-load of 63%, according to the 1952 report. This one handicap would make it difficult for any superintendent to make a good showing regardless of his efforts and aims. The arrangement and physical set-up preclude proper proper segregation as well as adequate security measures, permitting escapes which lead to bad publicity.

Appropriations have been received for three new buildings; one a 200-bed treatment building, providing an open-type ward; a separate building for 100 tuberculous patients; and another building to house 100 seniles of both sexes; this will greatly improve the over-crowded situation at the hospital. Construction of these buildings is under way pending approval of the best type of architectural planning. Dr. M. W. Conway, the present superintendent, is hopefully awaiting these improvements which will relieve his over-crowded situation. He has made several improvements in the handling of food and sanitation of the institution as well as landscaping some of the property. He has, also, provided recreational grounds for the care of the patients.

Only recently, the Board of Control of the State Hospital, has asked for a Medical Advisory Board to be provided by the Arizona Medical Association. The Council has approved the present Sub-Committee on Mental Diseases to act as this Board. We are hopeful that this will provide better liason between the institution and the Arizona Medical Association.

Other activities of the Sub-Committee on Mental Diseases have been to

(Continued on the Next Page)

XUM

provide lists of subjects and speakers from the Arizona Psychiatric Association which are available to the State Medical Association for programs on local or county meetings. The Sub-Committee, in co-operation with the State Bar Association, amended the State code with regard to commitments. The new revision is an improvement over the old; however, it is not the model code the Sub-Committee presented as approved by the A.P.A.

It is hoped that the mental health program, in Arizona, can be improved or rendered more effective by co-operating with the newly formed Committee on Mental Health of the American Medical Association, now engaged in correlating all existing state and county mental health organizations with a view toward establishing a coordinated planning for mental health throughout organized medicine.

Present membership of the Sub-Committee on Mental Diseases is: Dr. John R. Green, Phoenix; Dr. Lindsay E. Beaton, Tucson; Dr. Richard E. H. Duisberg, Phoenix; Dr. William B. McGrath, Phoenix, and Dr. Ernest A. Born, Prescott, Chairman.

Woman's AUXILIARY

CIVIL DEFENSE

The Women's Auxiliary to the Arizona Medical Association is now entering its third year in assisting the physicians of this state in their civil defense program. Today the auxiliary has assumed an important role in the medical set-up and has become a vital part of the Arizona state defense program. America, in war or peace, needs the facilities that the C. D. offers. Our program means preparedness in time of disaster.

Accordingly, under the chairmanship of Mrs. William McKersie, the national civilian defense section of the American Medical Association has been divided into four regional areas. Arizona is a member of the western C. D., headed by Mrs. Frederick J. Miller of Bakersfield, California. Our pattern of organization consists of a state representative and a chairman of each county auxiliary.

Pima County, realizing the need for education and organization among their members, sent their representative to the western training school in California along with the leaders of the other groups. This was arranged through the local office so that these trained women could return and set up educational courses to train other workers. The second one of these schools was held this year. A two day orientation course was held in Tucson under the auspices of Mrs. Grace Doebler, assistant director of the Pima County Civilian Defense Program.

In 1954 we will strive for four main objectives:

1. The training of county chairmen. This will be done in the school previously mentioned. We were privileged to have Maricopa county's representative, Mrs. Ruland W. Hussong of Phoenix, attend our October meeting.

2. Family action program. The National Civilian Defense has put out an instructors manual enabling each chairman to go into her organization and teach protection of the family and home in time of disaster.

3. Civilian defense presentation program. Each county representative has set aside at least one or more meetings for comprehensive instruction. This is facilitated by films and speakers.

4. Coordination with state officials. Each county auxiliary chairman has contacted her local office with offers of assistance and co-operation. We have been working jointly with our local civilian defense chiefs in the establishment of casualty clearing stations.

As always, we are endeavoring to improve public relations and to render service to our community and to our doctors.

Mrs. Frank A. Shallenberger
State Civil Defense Chairman

NEWS ITEM

We regret to announce that Graham County has disbanded. We will miss them from the ranks of organized auxiliaries, but hope to welcome each one of them as a member-at-large.

Mrs. George S. Enfield

In very special cases
A very superior Brandy

Specify 84 PROOF

★ ★ ★

HENNESSY

THE WORLD'S PREFERRED
COGNAC BRANDY

For a beautifully illustrated book on the story of Hennessy, write—

Schieffelin & Co., Dept. HT, 30 Cooper Square, N. Y. 54

RADIUM and RADIUM D+E

(Including Radium Applicators)

FOR ALL MEDICAL PURPOSES

Est. 1919

Quincy X-Ray and Radium Laboratories

(Owned and Directed by a Physician-Radiologist)

Harold Swanberg, B. S., M. D., Director

W. C. U. Bldg. Quincy, Illinois

TRUSSES – SURGICAL SUPPORTS

GROVE'S

Surgical Supports Store
3123 N. Central – Phone CR 4-5562
Lady and Man Fitter – Fitted Exactly As You Order
Across from Park Central Development On Central Avenue – Private Fitting Rooms
Free Parking – Open Wednesday Nights

ARIZONA LIBRARY BINDING COMPANY

Binders of Medical Journals and Books
We Pay Freight Charges on Return Shipments
Prompt Service

Arnold A. Couturier

307 West Monroe – Phone ALpine 3-1861
Phoenix, Arizona

Auralgan
In Acute Otitis Media
Rhinalgan
Safe Nasal Decongestant
O-tos-mo-san
In Fungus and Bacterial Ears

PAUL DESILETS

Representative
515 Ocean Ave. – Seal Beach, Calif.
DOHO CHEMICAL CORP.
100 Varick Street, New York 13, N. Y.
Telephone Worth 2-7707

NEWS ITEM

DONALD J. McNAIRY, M.D., Phoenix, is attending the meeting of the American Academy of Dermatology and Syphilology. This meeting will last a week and Dr. McNairy, is on the teaching staff for that week teaching medical photography. The dates are Dec. 5 to 10.

HILL-BURTON HOSPITAL CONSTRUCTION IN ARIZONA

COMPLETED AND IN OPERATION: Eight projects at a total cost of $9,168,590, including federal contribution of $2,632,516 and supplying 621 additional beds.

UNDER CONSTRUCTION: Five projects at a total cost of $2,558,906, including federal contribution of $822,496 and designed to supply 286 additional beds.

APPROVED BUT NOT YET UNDER CONSTRUCTION: One project at a total cost of $24,000, including federal contribution of $12,000.

MEDICAL - DENTAL OFFICE

Seven rooms — Parking area
718 N. Country Club Road
Tucson, Arizona
PHONE 4-1971 or 6-5937

SCOTTSDALE

Arizona's Most Progressive and fastest growing community with high per capita income.
Has an ideal Office Building, residence in rear.
Combination available for lease or sale.
PHONE: WHitney 5-6247 or WHitney 5-6242

ALCOHOLIC ANONYMOUS

"Fifth Annual International Group of Doctors in Alcoholic Anonymous, Mayflower Hotel, Akron, Ohio, May 14, 15, and 16, 1954. For information and reservations address: Doctor Mayflower Hotel, Akron, Ohio."

LABORATORIES

PROFESSIONAL X-RAY AND CLINICAL LABORATORY

507 Professional Bldg.
Phoenix, Arizona
Phone ALpine 3-4105

AND

MEDICAL CENTER X-RAY AND CLINICAL LABORATORY

1313 North 2nd Street
Phoenix, Arizona
Phone ALpine 8-3484

DIAGNOSTIC X-RAY — X-RAY THERAPY
RADIUM THERAPY
CLINICAL PATHOLOGY — TISSUE PATHOLOGY
ELECTROCARDIOGRAPHY — BASAL METABOLISM

R. Lee Foster, M.D., Director — John W. Kennedy, M.D., Radiologist
W. Warner Watkins, M.D., Radiologist
Diplomates of American Board of Radiology
Lorel A. Stapley, M.D., Consultant Pathologist

LABORATORIES

Medical Arts Bldg.
543 E. McDowell Rd.

Telephone
ALpine 8-1601

PHOENIX, ARIZONA

The Diagnostic Laboratory

A Complete Analytical and Laboratory Service To The Medical Profession of Arizona

Protein Bound Iodine
Blood Cholinesterase
17-Ketosteroids
Corticosteroids
Phophatases
Vitamin Determinations
Blood Volume
Blood pH Values
Electrolytes
Toxicology
Autopsies
Papanicolaou Stains
Liver Function Tests
Porphyrins

Streptolysin Titres
Rh Antibody Titres
Quantitative Serology
Heterophile Titres
Autogenous Vaccines
Hematology
Bacteriology
Parasitology
Gastric Analysis
Friedman Tests
Frog Pregnancy Tests
Mycology
Enzyme Chemistry
Spectroscopic Analysis

Radiography
Pelvimetry
Electrocardiography
Basal Metabolism
Vital Capacity
Salpingograms
Cholecystograms
Bronchograms
Gall Bladder Series
G. I. Series
Pyelograms
Myelograms
Cystograms
Electrometric Analysis

Maurice Rosenthal, M.D.
Diplomate, American Board of Pathology

Douglas D. Gain, M.D.
Diplomate, American Board of Radiology

Ernest H. Price, M.D.
Diplomate, American Board of Radiology

George Scharf, M.D.
Diplomate, American Board of Pathology

G. O. HARTMAN, M.D.

PATHOLOGICAL LABORATORY

20 E. Ochoa St. Phone: 3-4861

TUCSON, ARIZONA

Professional X-ray and Clinical Laboratory

Successor To
PATHOLOGICAL LABORATORY
507 Professional Bldg.
Phoenix, Arizona
Phone ALpine 3-4105
DRS. FOSTER, WATKINS and KENNEDY

THIS SPACE FOR SALE
FOR INFORMATION AND RATES
write to
ARIZONA MEDICINE
424 Heard Bldg.
Phone ALpine 2-4884
PHOENIX, ARIZONA

MEDICAL CENTER X-RAY AND CLINICAL LABORATORY

1313 N. Second St.
Phoenix, Arizona
Phone ALpine 8-3484
DRS. FOSTER, WATKINS and KENNEDY

XUM

SANATORIUM DIRECTORY

LIVERMORE SANITARIUM

• The Hydropathic Department devoted to the treatment of general diseases, excluding surgical and acute infectious cases. Special attention given functional and organic nervous diseases. A well equipped clinical laboratory and modern X-ray Department are in use for diagnosis.

• The Cottage Department (for mental patients) has its own facilities for hydropathic and other treatments. It consists of small cottages with homelike surroundings, permitting the segregation of patients in accordance with the type of psychosis. Also bungalows for individual patients, offering the highest class of accommodations with privacy and comfort.

GENERAL FEATURES

1. Climatic advantages not excelled in United States. Beautiful grounds and attractive surrounding country.
2. Indoor and outdoor gymnastics under the charge of an athletic director. An excellent Occupational Department.
3. A resident medical staff. A large and well-trained nursing staff so that each patient is given careful individual attention.

Information and circulars upon request.

Address: O. B. JENSEN, M.D.
Superintendent and Medical Director
LIVERMORE, CALIFORNIA
Telephone 313

CITY OFFICES:

SAN FRANCISCO
450 Sutter Street
GArfield 1-5040

OAKLAND
1624 Franklin Street
GLencourt 1-5988

McKEE REST HOME

Aged & Convalescents — Home-like Atmosphere

24 Hour Nursing Care

Good Meals

644 E. 4th St. — Phone 4-1971 — Tucson, Ariz.

HILLCREST SANATORIUM

- Aged and Convalescents only.
- Cheerful Private Rooms.
- Reasonable Rates.
- 24 Hour Nursing Service.
- Non-Contagious — Non-Alcoholics — Non-Addicts

Phone 4-1562
No. 3rd Ave & Adams Tucson, Arizona

BUTLERS REST HOME

- Bed Patients and Chronics.
- Excellent Food.
- Television.

802 N. 7th St. Phoenix, Arizona
Telephone AL 3-2592

THIS SPACE FOR SALE
FOR INFORMATION AND RATES
write to
ARIZONA MEDICINE
424 Heard Bldg.
Phone ALpine 2-4884
PHOENIX, ARIZONA

SANATORIUM DIRECTORY–Cont'd)

Catalina

Sanatorium for the Non-infectious

Arizona Nursing Home License No. 4

Member, **National Association of Registered Nursing Homes**

Member, **Arizona Association of Nursing Homes**

Certified by Maricopa County Health Dept.

5055 N. 34th St., at E. Camelback Rd., Phoenix
Phone: AMherst 6-7238

ALCOHOLISM

A new, growing public understanding of alcoholism, as an illness, is creating a rapidly increasing demand for the services of the medical profession in bringing this major illness under control.

The Franklin Hospital has been established and it exists for the purpose of assisting the medical profession in meeting this demand.

THE FRANKLIN HOSPITAL IS OPEN STAFF.

Its facilities are available for the hospitalization and care of patients under the direction of any Doctor of Medicine licensed to practice in the state of Arizona.

No so called "cure" or set course of treatment is advocated at The Franklin. The attending physician determines the course of care and treatment best suited to the needs of the individual patient.

Hospital License No. 71

The Franklin Hospital, Inc.

ALCOHOLIC PROBLEMS - EXCLUSIVELY
367 N. 21st Ave., Just Above Van Buren
Telephone ALpine 3-4731
Phoenix, Arizona

Las Encinas SANITARIUM

INTERNAL MEDICINE and NERVOUS DISORDERS

MEDICAL STAFF

CHARLES W. THOMPSON, M.D., F.A.C.P., Director
CLIFTON H. BRIGGS, M.D., F.A.C.S., Associate Director
ETHEL FANSON, M.D. CARLOS F. SACASA, M.D.
DOUGLAS R. DODGE, M.D. HERBERT A. DUNCAN, M.D.
KENNETH P. NASH, M.D.

PASADENA, CALIFORNIA

SANATORIUM DIRECTORY

GLENDALE NURSING HOME

Arizona newest, modern nursing home.

- Convalescent
- Custodial
- 24 Hour Nursing Care
- Special Diets. Quiet.

Lat. 16¾ and Glendale Avenue
Phones: AMherst 6-7001 — YEllowstone 7-7064
Glendale, Arizona
(Ray and Ruth Eckel)

DESERT REST HOME

Convalescent Tubercular

- Reasonable Rates
- 24 Hour Nursing Care
- Excellent Care

409 E. Townley Ave. — Phone WIndsor 3-3689
Phoenix, Arizona (Sunnyslope)
(Ray and Ruth Eckel)

MESA SANITARIUM

Convalescent — Ambulant
Physician and Registered Nurses
On 24 Hour Duty
Allene Lauck, R. N.—Prop.
Telephone WO 4-3780
42 South Country Club Drive
Mesa, Arizona

THIS SPACE FOR SALE
FOR INFORMATION AND RATES
write to
ARIZONA MEDICINE
424 Heard Bldg.
Phone ALpine 2-4884
PHOENIX, ARIZONA

AMBULANCE DIRECTORY

A & A AMBULANCE CO.

Tucson's Only Exclusive Ambulance Service
Oxygen Therapy
Day or Night
PHONE 3-3645
405 North 9th Ave. Tucson, Arizona

MEDICAL SUPPLY DIRECTORY

ARIZONA MEDICAL SUPPLY CO.

PHONE 3-7581
1025 E. Broadway — Tucson, Arizona
Martin O. Kerfoot Geo. F. Dyer

MEDICAL BOOKS

ROBERTA DAVEY HALL

MEDICAL BOOKS
Of All Publishers

PROMPT HANDLING OF ALL ORDERS
To order: Telephone AMherst 5-1062
40 East Rose Lane
Phoenix, Arizona

THIS SPACE FOR SALE
write to
ARIZONA MEDICINE
424 Heard Bldg.
Phone ALpine 2-4884
PHOENIX, ARIZONA

MINERAL WELLS DIRECTORY

Buckhorn

- 27 Private Baths — 8 Whirlpool Baths
- 9 Massage Rooms
- 2 Lounge Rooms
- 10 Acres Beautiful Grounds

Open 8 a.m. to 8 p.m. Daily
Natural Hot Mineral Baths
(7 mi. East on Apache Trail)
Phone WOodland 4-7316 — Mesa, Arizona

X-RAY COMPANY

GENERAL ELECTRIC CO.
X-RAY DEPARTMENT
FOR SALE

Used G. E. 200 MA R&F Unit.
Hand Tilt Table. Good Condition.
General Electric Co. X-Ray Dept.
Ask for M. A. Schroeder — ALpine 4-0181

DRUGGISTS' DIRECTORY

Where Your Doctor Speaks and Your Druggist Serves

SIMON'S DRUGS

Prescriptions • Hospital Supplies • Sick Room Supplies • Pharmaceuticals • Baby Needs
Trusses • Crutches • Abdominal Supports

2829 W. Van Buren—Phones AP 8-1611 - AP 8-2662
Phoenix, Arizona
Ample Parking Space — City-wide Free Delivery

LAIRD & DINES

The REXALL *Store*

Reliable Prescription Service

WOodland 7-2922 Mill Ave. & 5th

Tempe, Arizona

WAYLAND'S

☆

Wayland's Prescription Pharmacy

13 E. Monroe Street

Phone ALpine 4-4171

PHOENIX, ARIZONA

☆

FREE DELIVERY

PRESCRIPTION

Complete line of
Hospital Beds, Crutches, Trusses and
Surgical Garments

THE PRESCRIPTION SHOP

45 East Broadway Phone 3-4701

TUCSON

D. F. Scheigert L. J. McKenna

MARTIN DRUG CO. Rexall

28 Registered Pharmacists

Tucson Casa Grande

MacALPINE DRUG CO.

A complete line of . . .

PHOTOGRAPHIC SUPPLIES
COSMETICS
LIQUOR AND
PRESCRIPTION DEPT.

Prompt FREE *delivery*

2303 North 7th St.,
PHOENIX, ARIZONA

phones: ALpine 4-2606
or ALpine 2-1573

✱THE REXALL STORE

XUM

DRUGGISTS' DIRECTORY

BEVERLY BURKE
PRESCRIPTION DRUG STORE
MEDICAL CENTER
1313 N. 2nd St. — Ph. ALpine 8-2706
Phoenix, Arizona

ALpine 3-2148
McCrary's
DRUG CO.
Central Ave. at McDowell

EUREKA DRUGS
PRESCRIPTIONS
"The Friendly Drug Store"
R. L. Gibson, Prop.
Phone 2-7153 Tucson, Arizona

FELSHER PRESCRIPTION PHARMACY
Sick Room Supplies — Vitamins
650 N. First Avenue — Phone ALpine 3-2070
Phoenix, Arizona

MEDICAL SQUARE PHARMACY
PRESCRIPTION SERVICE
P. M. Corke Phone 5-3371
1616 No. Tucson Blvd. — Tucson, Arizona

EVERYBODY'S DRUG COMPANY
Prescription Druggists
Phones: WO 4-4587 — WO 4-4588
Mesa, Arizona

Open 8 A.M. to 11 P.M. Daily & Sunday
Broadway Village Drug Store
PHONE 5-2631
Broadway at Country Club Road
(Free Delivery)
TUCSON ARIZONA

NATIONAL PHARMACY
Prescriptions
Phone 2-9779 340 Ajo Way
Tucson, Arizona

MONTE BLISS
Frontier Village Drug Store
"Your Reliable Neighborhood Prescription Pharmacy"
1700 N. Maple Blvd. Phone 5-5252
Tucson, Arizona

PULLINS
Prescriptions
400 E. Glendale
Phone YE 7-9848
Glendale, Arizona

JOHNSON'S DRUG STORE
PRESCRIPTIONS
"Service you will like"
Corner Speedway and Park Avenue
Phone 2-8865 Tucson, Arizona

STONE AND 3RD PHARMACY
749 N. Stone — Phone 3-6041
ENCANTO PARK DRUG CO.
3352 E. Speedway — Phone 5-3102
Tucson, Arizona

FLORES & SON
(FARMACIA FLORES)
"Your Nyal Service Drug Store"
W. Congress and Meyer Sts. Phone 3-3362
Tucson, Arizona

MODERN RX PHARMACY
TELEPHONE 20
NOGALES ARIZONA

DOCTORS' DIRECTORY

DOCTORS DIRECTORY ESTABLISHED 1920

ALpine 3-4189

Emergency calls given special attention. We will locate your doctor before or after office hours.
BERTHA CASE, R.N., Director
ADA JOY CASE
1541 East Roosevelt
Phoenix, Arizona

DOCTORS CENTRAL DIRECTORY

Minnie C. Benson, R.N., Manager
For Emergencies or in Absence of Your Doctor
CALL 5-1551
At Your Service 24 Hours Daily
E. Hedrick Dr. Tucson, Arizona
"Established 1932"

MARICOPA COUNTY MEDICAL SOCIETY DIRECTORY

Operated by District No. 1 of the Arizona State Nurses' Association
Mrs. Marjorie E. Kasun, R.N., Director
AL 3-5101
Office Open 24 Hours Daily
10 South 12th Avenue — Phoenix

NURSES' DIRECTORY

DISTRICT NO. 1
ARIZONA STATE NURSES ASS'N
MRS. MARJORIE E. KASUN, R.N., Registrar
Nurses' Professional Registry
10 S. 12th Ave. Phoenix Ph. ALpine 4-4151

PHYSICIANS' DIRECTORY

NEUROLOGY and PSYCHIATRY

OTTO L. BENDHEIM, M.D.

NEUROLOGY and PSYCHIATRY
1515 North Ninth Street
PHOENIX, ARIZONA
Certified by American Board of Psychiatry and Neurology

ROBERT L. BEAL, M.D.

Practice Limited to Psychiatry and Neurology
Park Central Medical Building
550 W. Thomas Road — 234 Patio D
Phone CR 4-6711
Phoenix, Arizona

RICHARD E. H. DUISBERG, M.D.

Diplomate American Board of Psychiatry and Neurology
Phoenix, Arizona

THIS SPACE FOR SALE
FOR INFORMATION AND RATES
write to
ARIZONA MEDICINE
424 Heard Bldg.
Phone ALpine 2-4884
PHOENIX, ARIZONA

PROCTOLOGY

WALLACE M. MEYER, M.D.

PROCTOLOGY
Park Central Medical Bldg.
Phone CR 4-5632
550 W. Thomas Road — 216 Patio B
Phoenix, Arizona

Plastic and Reconstructive Surgery

HOWARD C. LAWRENCE, M.D.

Diplomate of the American Board of Plastic Surgery
709 Professional Building
15 E. Monroe Street Phone ALpine 8-4101
Phoenix, Arizona

XUM

PHYSICIANS' DIRECTORY

UROLOGY

ROBERT H. CUMMINGS, M.D.
Diplomate of the American
Board of Urology
Park Central Medical Bldg.
Phone CR 4-4912
550 W. Thomas Road — 207 Patio A
Phoenix, Arizona

W. G. SHULTZ, M.D., F. A. C. S.
Diplomate of The American
Board of Urology
E. R. UPDEGRAFF, M.D.
1010 N. Country Club Road
Telephone 5-2609 Tucson, Arizona

PAUL L. SINGER, M.D., F. A. C. S.
Certified American Board of
UROLOGY
1313 N. Second Street Phone ALpine 3-1739
PHOENIX, ARIZONA

DONALD B. LEWIS, M.D.
UROLOGY
Certified by the American Board of Urology
123 So. Stone Ave. Phone 2-7081
Tucson, Arizona

ALLERGY

H. M. PURCELL, M.D.
Diplomate of the American Board of Urology
Park Central Medical Building
550 W. Thomas Road
Phone CR 4-5202
Phoenix, Arizona

E. A. GATTERDAM, M.D.
ALLERGY
15 E. Monroe St., Professional Bldg.
Office Hours: 11 A.M. to 5 P.M.
Phoenix, Arizona

CLINIC

NELSON CLINIC
D. E. NELSON, M.D.
A. H. ERICKSON, MD.
D. CLUFF, D.D.S.
503 Fifth Avenue
SAFFORD, ARIZONA

MALIGNANT DISEASE

JAMES M. OVENS, M.D.
F.A.C.S. F.I.C.S.
Diplomate American Board of Surgery
Cancer and Allied Diseases
608 Professional Bldg. Phone ALpine 4-1973
Phoenix, Arizona

ANESTHESIOLOGY

LOUISE BEWERSDORF, M.D.
HERMAN BEWERSDORF, M.D.
ANESTHESIOLOGY
Park Central Medical Bldg.
Phone CR 4-5674
550 W. Thomas Road — 24 R
Phoenix, Arizona

HOSPITAL

H. B. LEHMBERG, M.D.
J. T. O'NEIL, M.D.
Casa Grande Clinic Phone 4495
Casa Grande, Arizona

XUM

PHYSICIANS' DIRECTORY

INTERNAL MEDICINE

ROBERT S. FLINN, M.D.
INTERNAL MEDICINE
CARDIOLOGY and ELECTROCARDIOGRAPHY
Park Central Medical Bldg.
Phone AM 6-8485
550 W. Thomas Road – 217 Patio B
Phoenix, Arizona

JESSE D. HAMER, M.D.
F. A. C. P.
INTERNAL MEDICINE
CARDIOLOGY
Suit 910 Phoenix
15 E. Monroe St. Arizona

FRANK J. MILLOY, M.D.
F. A. C. P.
Diplomate of the American Board of Internal Medicine
INTERNAL MEDICINE
611 Professional Building
Phone ALpine 4-2171
Phoenix, Arizona

DAVID M. MARCUS, M.D.
INTERNAL MEDICINE
1850 N. Laurel Avenue – Phone ALpine 4-7970
Phoenix, Arizona

ROBERT E. RIDER, M.D.
INTERNAL MEDICINE
ELECTROCARDIOGRAPHY
Del Sol Hotel Bldg. Phone 3-3721
Yuma, Arizona

JOSEPH BANK, M.D.
Diplomate of
American Board of Internal Medicine
American Board of Gastroenterology
GASTROENTEROLOGY, GASTROSCOPY
800 North First Avenue Phone: ALpine 4-7245
PHOENIX, ARIZONA

OBSTETRICS and GYNECOLOGY

HARRY J. FELCH, M.D.
Physician and Surgeon

Residence	Office
325 W. Granada	703 Professional Bldg.
Phoenix, Arizona	15 E. Monroe Street
Res. AL 3-1151	Office AL 3-1151

GYNECOLOGY & ENDOCRINOLOGY

JOSEPH B. RADDIN, M. D.
Practice limited to
MEDICAL GYNECOLOGY & ENDOCRINOLOGY
619 Professional Building
15 E. Monroe – Phoenix, Arizona
Phone ALpine 2-3577

CHILDREN'S DISEASES

WM. F. SCHOFFMAN, M.D.
CECELIA H. SHEMBAB, M.D.
JOHN R. KEEFREY, M.D.
DOCTORS BUILDING
316 W. McDowell Rd. – Telephone ALpine 4-7287
Phoenix, Arizona

DERMATOLOGY

GEORGE K. ROGERS, M.D.
DERMATOLOGY
Diplomate of American Board of Dermatology and Syphilology
Phone ALpine 3-5264
105 W. McDowell Road Phoenix, Arizona

XUM

PHYSICIANS' DIRECTORY

SURGERY

EDWARD L. KETTENBACH, M.D., F.A.C.S., F.I.C.S.
SURGERY
Diplomate American Board of Surgery
2324 North Tucson Blvd. Phone 5-2605
Tucson, Arizona

DELBERT L. SECRIST, M.D., F. A. C. S.
123 South Stone Avenue
Tucson, Arizona
Office Phone 2-3371 Home Phone 5-9433

H. D. KETCHERSIDE, M.D.
SURGERY and UROLOGY
800 North First Avenue
Phone ALpine 4-7245
Phoenix, Arizona

W. R. MANNING, M.D., F.A.C.S.
SURGERY
Diplomate American Board of Surgery
620 North Country Club Road Phone 5-2687
Tucson, Arizona

DONALD A. POLSON, M.D., M. Sc.
GENERAL SURGERY
Certified by the American Board of Surgery
550 W. Thomas Road
Phone CRestwood 4-2081
Phoenix, Arizona

THOMAS H. BATE, M.D.
F.A.C.S., F.I.C.S.M.Sc. (Surgery)
PRACTICE LIMITED TO SURGERY
Diplomate American Board of Surgery
15 E. Monroe — Office Phone ALpine 4-3326
Phoenix, Arizona

ORTHOPEDIC SURGERY

GEORGE L. DIXON, M.D., F.A.C.S,
PHILIP G. DERICKSON, M.D.
ORTHOPAEDIC SURGERY
Diplomates of the American Board
of Orthopaedic Surgery
744 N. Country Club Road Telephone 5-1533
TUCSON, ARIZONA

GEO. A. WILLIAMSON, M.D., F. A. C. S.
Diplomate American Board of Orthopaedic Surgery
LEO L. TUVESON, M.D.
Orthopaedic Surgery
Park Central Medical Building
550 West Thomas Road — 116 Patio C
Telephone CRestwood 4-5459 — Phoenix, Arizona

ROBERT E. HASTINGS, M.D., F. A. C. S.
Diplomate American Board of Orthopaedic Surgery
ROBERT W. WEBER, M.D.
ORTHOPAEDIC SURGERY
1014 N. Country Club
TUCSON, ARIZONA

THIS SPACE FOR SALE
FOR INFORMATION AND RATES
write to
ARIZONA MEDICINE
424 Heard Bldg.
Phone ALpine 2-4884
PHOENIX, ARIZONA

XUM

XUM